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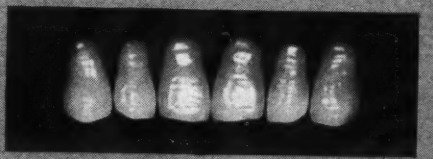

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Vol. 54, No. 4

Dental Digest

APRIL 1948

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About Our CONTRIBUTORS

Frank K. Sullivan received his D.D.S. degree from the College of Dentistry, University of Denver, in 1923. W. Basil Johnson, a Commander in the Naval Dental Corps, received his at the Baltimore College of Dental Surgery, Dental School, University of Maryland, in 1938. They were Senior Dental Officer and Senior Assistant Dental Officer respectively in the Dental Department of The Marine Training and Replacement Command, Camp Pendleton, Oceanside, California, at the time they authored Fixation in Maxillofacial Fractures. Doctor Sullivan has been retired from active duty, after twenty years of service in the Naval Dental Corps, and has entered private practice. He specializes in prosthodontics and dental surgery; Commander Johnson, in oral surgery.

Maurice J. Sheehy, Ph.B., D.D.S. (Georgetown University, School of Dentistry, 1943) was Assistant Professor of Prosthetic Dentistry at his alma mater for two years. Dental photography is one of the interests he has developed in his general practice. An Immediate Full Denture Technique is described by him wherein the plastic denture base material is permitted to finish processing in the patient's mouth.

Julius Michmann, Dr. med. dent., practices dentistry in Jerusalem. He obtained his degree from the University of Munich, Germany, in 1933. In 1947 he attended the convention of the American Dental Association as a delegate of the Palestine Dental Association. Doctor Michmann remained in this country for several months to study new trends and developments in American dentistry, especially in the field of full and partial denture prosthesis. He is in charge of the Partial Denture and Dental Materials section of the *Journal of the Palestine Dental Association*, and with this issue becomes a contributor to the Digest through presentation of his technique, Repairing Broken Facings with a Modified Acrylic Crown.

George A. Morgan, L.D.S., D.D.S. (Royal College of Dental Surgeons, Toronto, 1930) this month begins a series of articles on problems in differential diagnosis. The first in the series concerns cysts in the maxillary region. Doctor Morgan is an oral surgeon. The dental literature contains numerous articles by him.

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The magazine is mailed on the fifteenth of the month of issue.

FIXATION *in Maxillofacial Fractures**

Captain FRANK K. SULLIVAN (DC) USN, and
Commander W. BASIL JOHNSON (DC) USN, Oceanside, California.

DIGEST

A device is described for the fixation of maxillary fracture fragments. It was designed to establish a stable base for fixation gear and ligatures and thus to immobilize facial fractures until they are joined in bony union. A case report illustrates its application.

Other advantages of this appliance over the plaster headcap, besides stability, are cited.

*The opinions or assertions contained herein are private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Description of Device

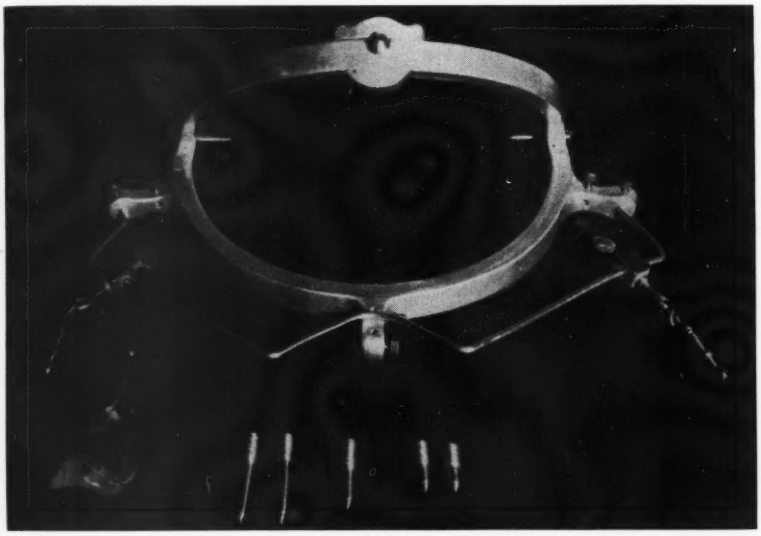
The recognition of the need for a more efficient and desirable method of maxillary fracture fixation than that obtainable with the traditional plaster headcap has resulted in the conception and production of the device described. The headcap is difficult to apply, exclusive, lacking in cleanliness and stability, awkward in weight, inefficient, and uncomfortable. To eliminate these disadvantages and provide the desired efficiency in fixation of fragments, M. J. Crawford (DC) USN, and F. A. Bloom (MC) USNR, Lieutenant Commanders in their respective corps, attached to the U. S. Naval Hospital, Corpus Christi, Texas, in 1942 collaborated in designing and producing a new device.[1]

Twin-arm Metal Splint—The original model was cast from airplane propeller blade scrap, machined for attachment of turnbuckles and securing gear as developed by Doctor John B. Erich of the Mayo Clinic, Rochester, Minnesota (Fig. 1). It may be briefly described as a semicircumferential twin-arm metal splint. The splint is to be attached directly to the cortical layer of cranial bone with three stainless steel pins—two placed laterally, the points contacting the right and left eminences of the parietal areas; one placed vertically, in a modified ball-and-socket mounting in the top arm, in the median line at the crest of the frontal bone. The pins are secured to the device by screw threads. Their points pass through small incisions in the scalp, contacting the cranial surface just sufficiently to prevent lateral movements. This arrangement provides a three-point, immovably fixed suspension apparatus.

Stability: The reader will readily comprehend the positive stability attainable by such a suspension. It establishes an immovable, hence efficient, attachment to the cranium to be used as a base for fixation gear and ligatures. Compare with this the unstable plaster headcap, or other types which depend on the movable scalp for a base!

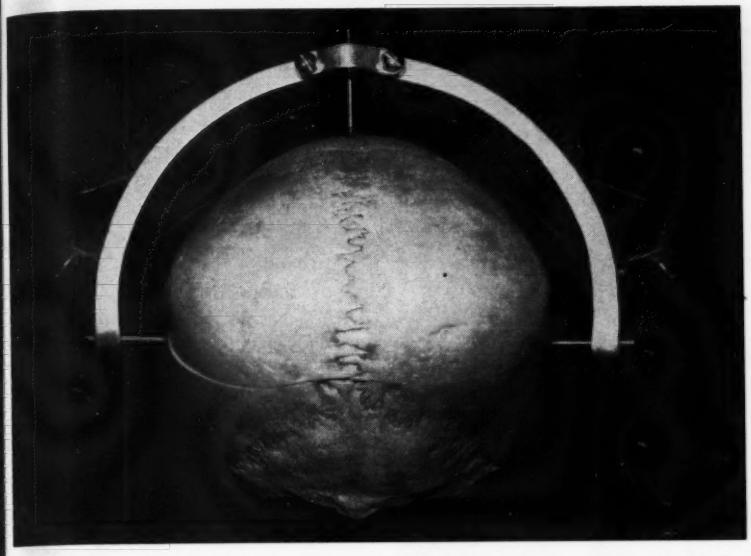
Other Advantages: 1. Ease of application.

2. Accessibility of scalp for con-



1. ***Fracture device with attached trellis as devised by Doctor John B. Erich of the Mayo Clinic. In the foreground are several attachment screw pins of different lengths. These accommodate various-sized crania. In the left foreground is the acrylic nasal splint used in the fixation of the patient's nasal bones.***

[1]Crawford, Merritt J.: Appliances and Attachments for Treatment of Upper Jaw Fractures, U. S. Navy M. Bull. 41:1151-1157 (July) 1943.



2. ***Method of fixation with stainless steel pins. Points contact the cortical layer of bone of cranium making minute indentations thereon which suffice to provide a three-point immovable attachment to cranium.***

tinued treatment of possible lacerations incurred at the time of injury.

3. Aeration of scalp and hair, eliminating uncleanliness, itching, and loss of hair.

4. Comfort through light weight (10½ ounces).

5. Accessibility of cranium for further roentgenographic examinations.

Attachments—The lateral and anterior protuberances to be seen on the device are drilled for the reception of set screws and the wire (ordinary coat hanger gauge).

1. The wire serves as a trellis on which the mobile turnbuckle apparatus (Fig. 1) may be set to provide for the attachment of ligature wires. These wires pass through the cheek tissue to the arch bar ligated to the maxillary teeth or denture (Figs. 3 and 3A).

2. The protuberances further provide for the attachment of various external fixation and traction gear; their use is limited only by the resourcefulness of the operator in planning the procedure for handling a case.

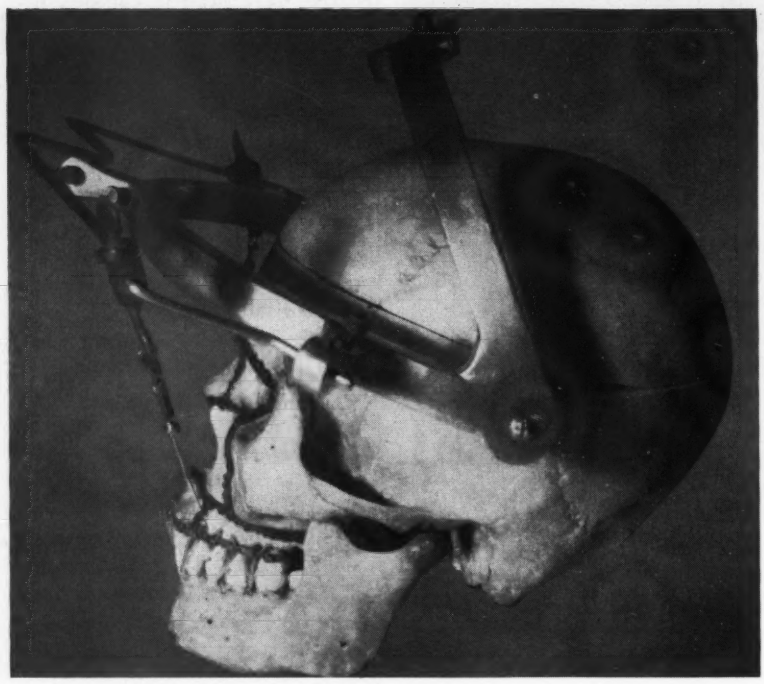
While the splint was designed primarily for use in the treatment of men, it is obviously useful and advantageous in the case of women patients, especially from the standpoint of aeration of the scalp and hair.

Case Report

A young woman, aged 25, was admitted to the outpatient department of a U. S. Naval Hospital with extensive facial and cranial injuries incurred in a head-on collision between two automobiles. She was conscious and rational, bleeding from lacerations and from her nose.

Clinical Examination—A depressed compound fracture of the skull existed in the right supra-orbital region. A three-inch laceration extended from the external corner of the right eye diagonally upward across the lid and supra-orbital ridge to beyond the median line. A puncture wound was present in the right side of the bridge of the nose (Fig. 4). Serosanguineous fluid drained from the nose. A test for cerebrospinal rhinorrhea was positive, indicating a fracture of the cribiform plate of the ethmoid bone. A nasal deformity was present with the nose freely movable. The maxillae appeared to be displaced downward and were freely movable by the patient on slight external pressure, which indicated a complete horizontal fracture. Palpations of the right malar area revealed crepitus. No clinical evidence of fracture of the mandible was present. The pulse was 96, respiration 21, blood pressure 115/60; airways were adequate.

3. ***Anterior view of device in position. Wires pass through buccal tissues from trellis apparatus to maxillary arch band secured to the teeth. Reduced fracture fragments are thereby securely fixed in position. Rubber ligatures can be seen attached from maxillary arch band to continuous loop wiring on mandibular teeth. (Cranium pictured in these illustrations is a much-used study specimen. Note osteostudy on right mandibular area.) Black lines represent fractures.***



3a. ***Lateral view of set-up described in legend for Figure 3.***

1000 cubic centimeters of 5 per cent dextrose solution. Fifty thousand units penicillin were given every three hours.

The plan for reducing and fixating the maxillary and nasal fractures was in complete accord with Maxwell and others:[2] "There has been an interesting transition in thought in regard to the management of head injury cases exhibiting multiple fractures of the middle third of the face. For many years these patients were placed in a state of complete rest with a 'hands off' policy insofar as manipulation and reduction of fractured facial bones were concerned. Current practice, based on clinical observation, indicates that early treatment may be instituted in the majority of cases. Even though there is fracture of the cribiform plate or other parts of the cranial fossae, it is believed that early reduction, without undue trauma, lessens the risk of an ensuing meningitis

[2]Maxwell, M. M.: Rationale of Treatment in Maxillo-facial Injuries With Report of Four Cases, J. Oral Surg. 4:269-303 (October) 1946.

Roentgenographic Report—Roentgenograms revealed a comminuted maxillo-facial fracture involving the right frontal sinus, its anterior plate depressed against the posterior plate. The fracture line ran into the right side of the frontal bone and into the right fronto-zygomatic suture. The roof of the right orbit had been fractured and buckled. A comminuted fracture involved the right malar bone and both maxillary bones; they had been displaced posteriorly to a considerable degree. There were bilateral fractures of the alveolar process of the maxillae posterior to the cuspid teeth. Comminuted fractures of nasal bones were in evidence. The mandible was negative for fractures.

Impression—A combination of horizontal fractures of the nasal bones, maxillae, and right orbital region; a pyramidal facial and transverse facial fracture; vertical fractures of the maxillae posterior to the cuspid teeth (Fig. 3).

Treatment Plan—Cranial injuries involving the right frontal sinus were treated by neurosurgical service. Two hundred thousand units of penicillin were administered to the patient with

4. ***View of patient immediately after operation. Black spots at points at which wires enter cheek are gentian violet stain used as landmarks in making tissue punctures for passage of securing wires. Sutures visible across area of right eye reveal to some extent laceration described in article. Nasal reduction had not been attempted when this picture was taken; mucous membranes in this area were inflamed and unhealed. Rhinorrhea (suspected to originate from fractured cribiform plate of ethmoid bone) was present.***

5. ***Lateral view of patient illustrating utilization of acrylic splint fashioned for purpose of securing nasal bones in desired position. These were reduced several days after original fracture operation.***

owing to the closure of avenues of infection, diminishes the symptoms of shock, and places the patient in a more comfortable condition. If protracted treatment for reduction is contraindicated, simple finger or forcep manipulation to accomplish gross reduction has tremendous value." Obviously, the immediate institution of an effective chemotherapeutic agent, particularly penicillin or a sulfa-compound, is a requirement.

A decision was made on the fourth day following injury to prepare the patient for operation. At this time she was afebrile, a condition believed to be largely the result of immediate hospitalization and particularly the institution of penicillin therapy. On the following day alginate impressions were obtained and poured in artificial stone. These were to be used as study models and for adaptation of an arch bar on the cast of the maxillary teeth.

(Note: A medium flat lower tray was used to take an impression of the maxillary teeth. This enabled the operator to stabilize the maxillae advantageously by placing a finger directly on the palate to provide counterpressure when removing the impression.)

On the sixth day following injury, the patient was operated upon.

Operative Procedure—1. The scalp was shaved in the areas selected for the insertion of pins; namely, spaces not less than three inches in diameter, two laterally situated, in the region of the parietal eminences, and one superiorly located in the median line at the crest of the cranium (frontal bone).

2. The previously adapted maxillary arch bar and mandibular continuous loop wiring were attached.

3. Operators scrubbed for surgical procedure.

4. Pin insertion and cheek tissue areas were sterilized and infiltrated with 2 per cent procaine.

5. The exact locations of incisions for pin insertions were determined by trial positioning of the fracture device and marked with gentian violet. Half-inch long incisions were made vertically, subcutaneous tissues being carefully dissected through to the cortical surface.

The device was attached by threading the two lateral pins through the screw holes to the extent of barely engaging the points in the cortex of the cranium. The third pin was inserted likewise in the upper crossarm in the median line at the crest of the frontal bone at a point and angle required to position the main arm horizontally across the forehead; the modified ball-and-socket fitting was secured by set screws. The splint was thus rigidly attached to the cranium (Figs. 2, 3, 3A, and 4).

6. A stainless steel wire, 0.020 inch in diameter, of orthodontic type, was passed through the cheeks at points marked with gentian violet (Fig. 4). A straight-cutting needle threaded with double strands of wire (to avoid laceration) was used. The needle and one strand were cut free and removed through the mouth. The remaining strand was attached to the arch bar in the first molar, second bicuspid region; the maxillae were positioned to provide proper occlusion of the teeth; interdental elastic traction was established; and the extra-oral end of the wire attached to the turnbuckle adjusted to and set at the position desired on the trellis. Care was exercised in the latter step to direct the pulling of the taut wire through the cheek punctures in such a manner as to prevent it from encroaching on and cutting the tissue.

7. All areas of incision were cleaned and sterile dressings securely applied in pin regions. Figure 4 shows the patient immediately following the operative procedure.

Postoperative Observations and Treatment—Observations of the patient within the hour following operation were: (1) cessation of cerebrospinal rhinorrhea; (2) gradually disappearing diplopia of right eye; (3) more adequate airways; (4) distinct sensation of improved physical well-being.

Daily postoperative care consisted of oral cleansing, changing dressings, and occasional minor adjustments of the gear.

Fifth Day: Penicillin was discontinued and rubber bands provid-

(*Continued on page* 167)

An Immediate FULL DENTURE *Technique* *

MAURICE J. SHEEHY, D.D.S., Westbrook, Maine

DIGEST

The essential difference between this technique and other immediate full denture techniques lies in the method of processing the plastic denture base material: The denture base material is permitted to finish processing in the patient's mouth.

The technique does not require any especially compounded dental acrylic. Any one of the reputable dental acrylics may be used. Neither does it require any special laboratory equipment. Nothing but standard laboratory equipment need be used.

*Presented at the Eighty-fourth Annual Convention of the New England Dental Society, Forsyth Dental Infirmary, Boston, Massachusetts, on November 6, 1947.

Technique

Impressions—The maxillary impression can be made according to the method of choice; that is, it can be made in plaster, compound, or any combination of materials. The important fact to remember is: The impression is being made for the purpose of constructing a full denture; therefore, the impression material must completely fill the buccal and labial vaults to permit proper muscle-trimming.

The mandibular impression may likewise be made according to the method of choice.

Models—These should be poured in stone. Use as thick a mix as possible and vibrate well to eliminate as many air bubbles as possible.

Baseplate—Adapt a double-thickness of *shellac type* baseplate to the maxillary model in the manner prescribed for a partial denture. Eugenol type baseplates and wax baseplates are contraindicated because they warp and become distorted.

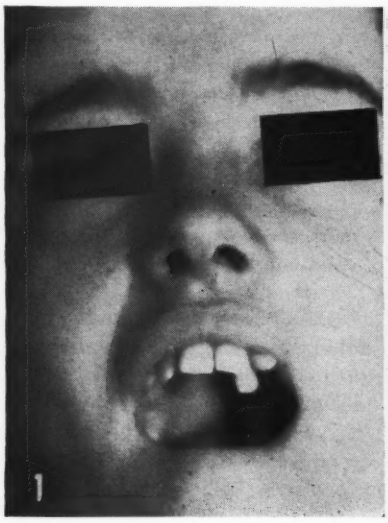
Biterim—The maxillary biterim is constructed of pink baseplate wax in the manner prescribed for partial dentures.

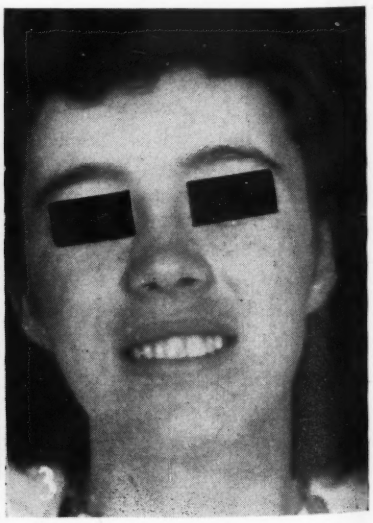
Facebow—The facebow record is made in the manner prescribed for partial dentures. The maxillary model is mounted on an anatomic articulator according to the facebow record.

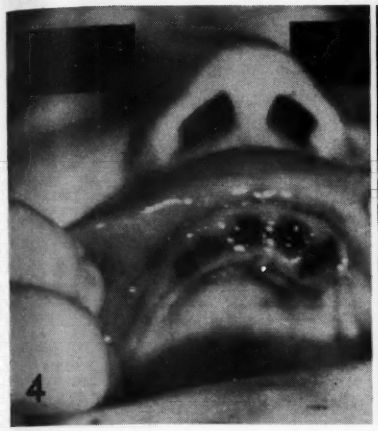
1. ***Pre-extraction photograph. Notice lingual position of upper left lateral incisor.***

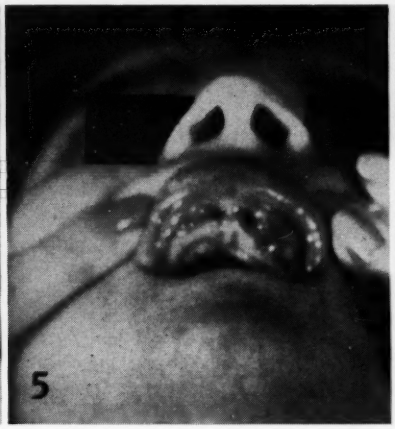
2. ***Denture immediately after insertion. Note how appearance of large central incisors has been retained for the esthetics. Upper left lateral incisor has been brought into alinement with adjacent teeth in the arch to improve girl's appearance. Apparent swelling of upper lip is due to the procaine injected for the extractions.***

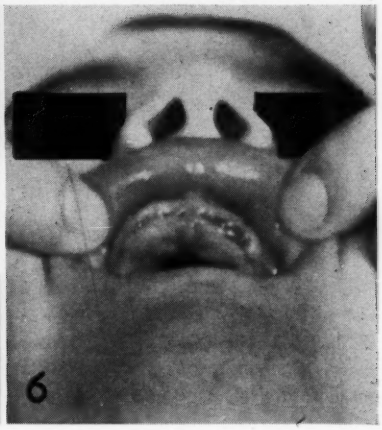
3. ***Denture six weeks after extractions.***











Centric Record—This is sometimes referred to as the "bite" and can be taken in the manner of choice. The mandibular model is mounted on the articulator according to this record.

Protrusive Record—The slope of each individual condyle path is determined by means of this record. The respective condylar clocks of the anatomic articulator are set accordingly.

Posterior Setup—Set up the posterior teeth first. The success of this technique depends largely on the results obtained in the setting up of the posterior teeth. The occlusion must be balanced. Do as little grinding as possible on the occlusal surfaces of the teeth.

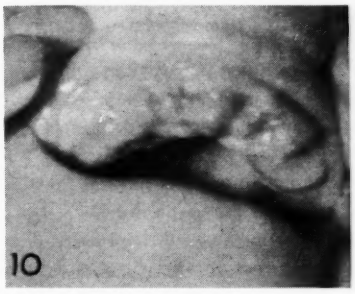
When all of the posterior teeth have been set up, check both the centric and eccentric occlusions with articulating paper. Try the posterior setup in the mouth. Recheck the centric and eccentric occlusions in the mouth with articulating paper. *Do not* attempt to final balance the occlusion by using milling paste in the mouth at this time because the teeth are set in wax!

Anterior Setup—With a lead pencil, outline the gingival crevice on both the labial and lingual aspects of all the remaining anterior (natural)

4. ***Labial aspect of maxillary arch immediately following extractions. Note that bony process has not been trimmed.***

5. ***Labial aspect of maxillary arch three weeks after extractions.***

6. ***Labial aspect of maxillary arch six weeks after extractions.***

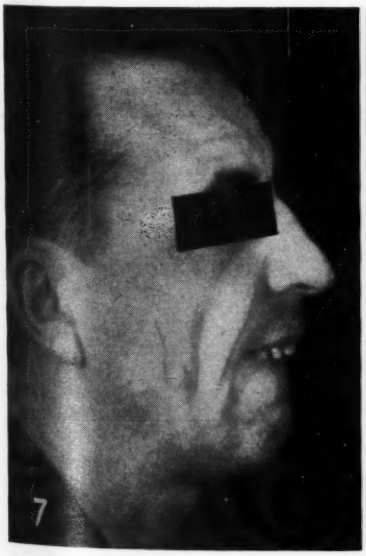


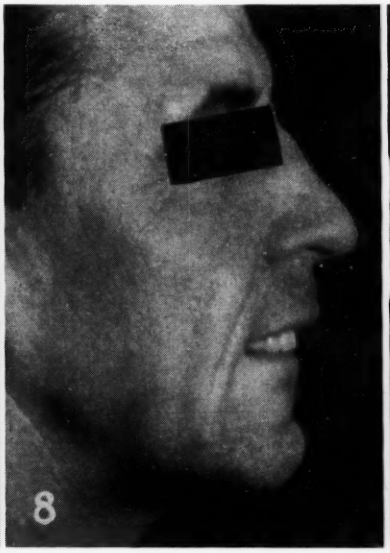
10. ***Labial aspect of the maxillary arch, eight weeks after the extractions.***

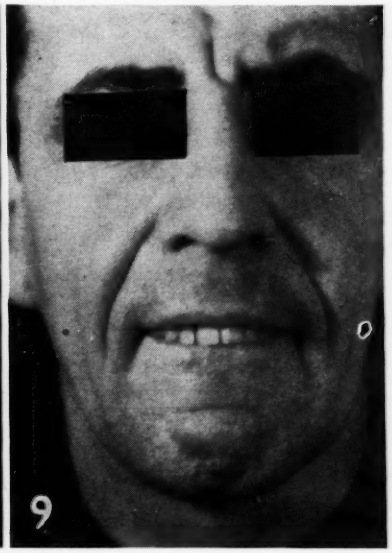
7. ***Pre-extraction photograph, profile view, showing natural maxillary dentition.***

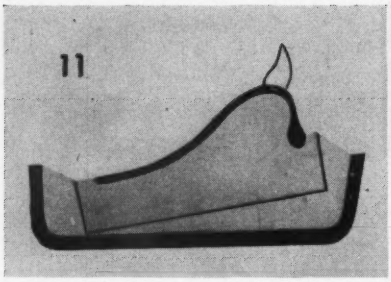
8. ***Postextraction photograph, profile view, showing maxillary denture in position, eight weeks after its insertion.***

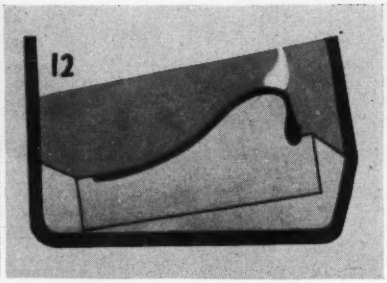
9. ***Postextraction photograph, full face view, showing maxillary denture in position, eight weeks after insertion.***

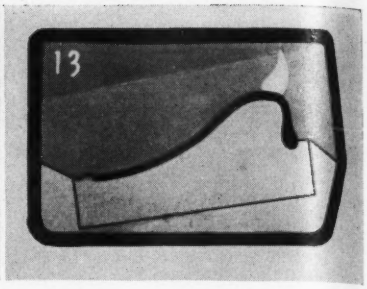












teeth on the model. Replace the baseplate, with the posterior setup, on the model and seal it to the model. Using either a bur or a sharp-bladed instrument, remove the upper right lateral incisor from the model. *Do not hollow out the socket!*

Replace this tooth with the denture tooth. Remove and replace the remaining teeth in the following order: upper left central incisor; upper left cuspid; upper left lateral incisor; upper right central incisor; upper right cuspid.

Final Wax-up—The labial aspect of the denture is waxed in a tapering fashion, the thickest portion being in the mucolabial fold, the thinnest portion across the labial aspect of the anterior ridge. The palatal portion should be waxed no thicker than a double thickness of baseplate. Contour the wax-up as desired and flame it gently to remove all blemishes. Polish the wax-up by rubbing it gently with a soft wet cloth or a wet paper towel.

Soaking Model—Remove the model from the articulator and place it in a pan. Cover the bottom of the pan with room temperature water to a depth of one-eighth of an inch. Do not permit the water to come in direct contact with the wax. Allow the model to soak for at least fifteen minutes.

11. ***Wax-up invested in pan portion of flask. Note labial aspect of central incisor is at right angle to base of flask.***

12. ***Investment layer of stone in position. Note that top surface of stone is not parallel with base of flask; it is flush with occlusal surfaces of the anterior and posterior teeth.***

13. ***Case completely invested.***

Investing Case—1. Lubricate the inside of an ejector-type flask with a thin layer of vaseline; fill the pan portion of the flask with model plaster; seat the model in the plaster with the labial surfaces of the central incisors at right angles to the bottom of the flask; remove the excess plaster until the remaining plaster is flush with the shoulder of the model and the rim of the flask (Fig. 11). Allow the plaster to set at least twenty minutes.

2. Lubricate the surface of the plaster with a thin layer of vaseline or similar separating medium; place the ring portion of the flask in place; make a thick mix of stone; vibrate just enough stone into the flask to fill it up but *not over* the occlusal surfaces of the teeth (Fig. 12). Allow the stone to set at least twenty minutes.

3. Lubricate the surface of the stone with vaseline or similar separating material; fill the remainder of the flask with stone; place the cover in position, and allow the stone to set for at least one-half hour (Fig. 13).

Boil-out—1. Submerge the flask in a kettle of boiling water for ten minutes.

2. Separate the halves of the flask; remove the softened baseplate, and flush the wax out with plenty of boiling water. *Don't use any wax solvents!* Remember, the teeth themselves are plastic and will check if wax solvents are used.

3. Allow the flask to cool.

4. Postdam the model in the usual manner. Add the relief metal.

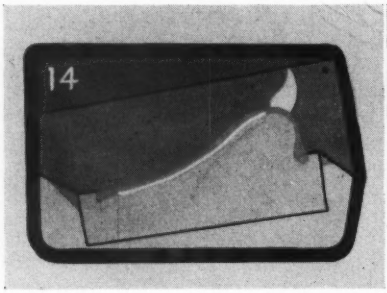
5. With a sharp instrument remove any sharp edges or projections in the interproximal spaces and round off any sharp edges along the labial and lingual gingivae.

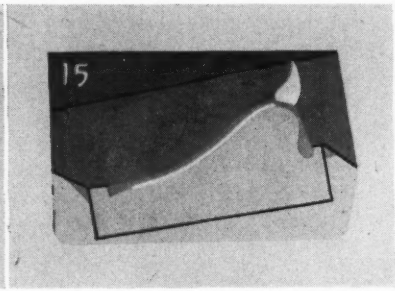
Excess Chamber—With a sharp chisel, cut a groove in the plaster completely around the model. The inner edge of the groove should be about one-eighth to one-quarter of an inch

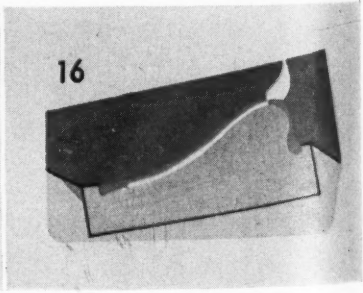
14. ***Case final-closed ready for processing. Note excess chamber, postdam, and relief metal.***

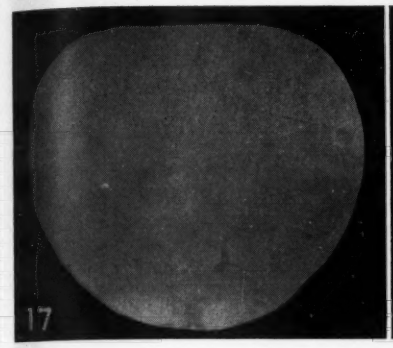
15. ***Case removed from flask after partial procesing.***

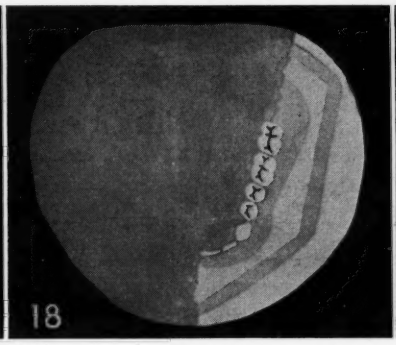
16. ***Top layer of stone removed.***

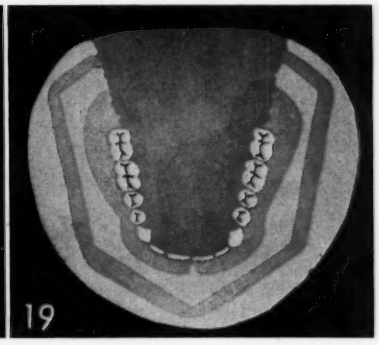












17. ***Occlusal view of top surface of investment layer of stone showing saw cut.***

18. ***Stone removed from one half the labial and buccal surface of the denture.***

19. ***Stone removed from other half of labial and buccal surface of denture on opposite side.***

from the peripheral border of the denture. The groove itself should be about one-quarter to one-half inch in width and one-eighth inch deep.

Trial Packing—Mix and pack the acrylic according to the manufacturer's directions. Cellophane may be used as a separating medium during the trial packing if desired. *Do not cure the denture against the cellophane as it is apt to produce creases in the buccal and labial borders of the acrylic.*

Processing Acrylic—1. When the case has been final closed (Fig. 14), place it in a spring type flask press. Suspend the press in a five-gallon container of water. Using a low gas flame, raise the temperature of the water from 60° Fahrenheit to 160° Fahrenheit in one hour.

2. Turn the heat off and allow the case to remain suspended in the water for 72 hours: The water tends to insulate the case against any sudden changes in temperature during the 72-hour period; it also prevents the acrylic liquid from evaporating.

Deflasking Case—1. Place the flask in a flask ejector. By means of the ejector, remove the case from the flask. (Remember, the model is encased in the layer of plaster; the teeth are encased in the middle layer [stone]; the top layer [stone] covers the occlusal surfaces of the teeth [Fig. 15]).

2. Insert a laboratory knife between the two layers of stone and pry off the top layer which is readily removable (Fig. 16).

3. Cut a deep vertical groove in the midline of the remaining layer of stone (Fig. 17). Insert the knife blade in the groove. A quick twist of the blade will remove the stone from half the labial and all the buccal surface of one side of the denture (Fig. 18).

4. Gently tap the cut surface of the remaining stone (at the midline) to remove it from the opposite side of the denture (Fig. 19).

5. Insert the knife blade between the layers of stone and plaster along the posterior border and pry upwards to remove the stone from the palatal surface of the denture (Fig. 20).

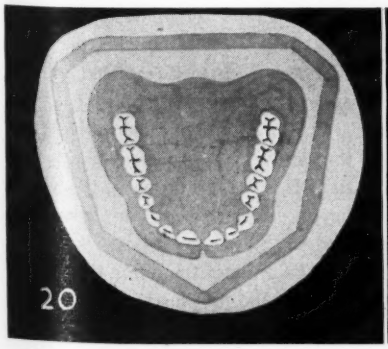
6. Grasp the model *and* denture firmly in the left hand, placing the thumb in the palatal portion of the denture and the fingers under the base of the model. Hold the model about six inches above the top of the bench. With a carpenter's hammer the plaster surrounding the model can be readily removed. Several consecutive blows are dealt the outer edge of the plaster, the direction of force being at right angles to the base of the model (Fig. 21). Pry off any plaster covering the base of the model.

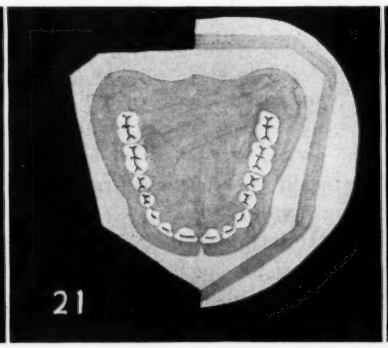
Separating Denture from Model—By this time you will have observed the pliability of the denture base material. Just because it is so pliable, *don't try to pry denture off the model* (Fig. 22)! Such a procedure will cause marked distortion.

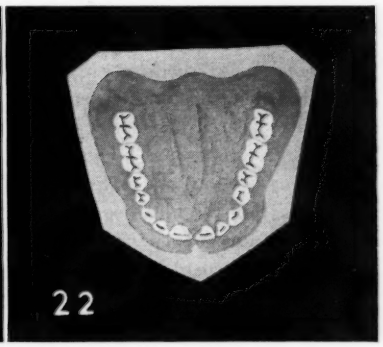
20. ***Stone removed from palatal aspect of denture.***

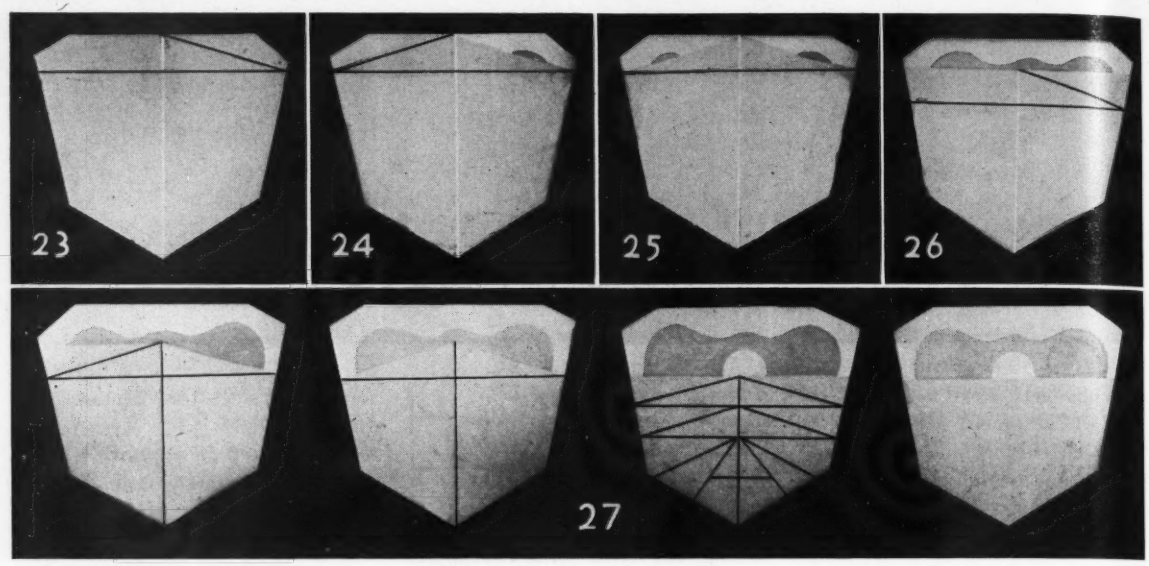
21. ***Plaster removed from one side of model.***

22. ***Plaster removed from opposite side of model.***









1. With the base of the model directed toward the ceiling, make the following perpendicular marks on the edges of the model with a lead pencil: Extend the midline up onto the anterior edge of the model; mark the posterior aspect of the midline on the posterior edge of the model; bisect the base of the model with a pencil line starting at the anterior marking and continuing posteriorly across the base of the model to the posterior mark.

For the sake of clarity, let us designate the anterior marking as point "A," the posterior marking as point "S," and the line connecting the two points as line "A-S."

About one-half inch anterior to point "S" on line "A-S," draw a line across the base of the model at right angles to line "A-S." Let us designate this line as "X-Y;" point "X" being the point where one end of the line reaches the edge of the model and point "Y" being the point where the other end of the line reaches the opposite edge of the model (Fig. 23).

2. Place the blade of a carpenter's saw on the base of the model so that it passes through points "S" and "Y." Saw a groove about one-eighth of an inch deep. Flip the blade so that the back of it is thrust forward in the direction of the cuspid tooth on the opposite side of the midline "A-S" to remove the section of the model posterior to the line "S-Y" (the saw cut) (Fig. 24).

23. ***Base of model showing markings for saw cuts.***

24. ***Left heel of denture becomes visible on removal of the section of model posterior to saw cut made along line "S-Y."***

25. ***Right heel of denture becomes visible on removal of section of model posterior to saw cut made along line "S-X."***

26. ***Posterior border of denture becomes visible on removal of section of model posterior to saw cut made along line "X-Y."***

27. ***Lines showing remaining saw cuts necessary to facilitate elimination of the remaining portion of model without cracking, tearing, or distorting labial flange of the denture.***

3. Similarly, cut a groove running from point "S" to point "X." Remove that portion of the model posterior to line "S-X" by thrusting the back of the saw blade forward in the direction of the cuspid tooth on the opposite side of the midline "A-S" (Fig. 25).

4. Cut a groove along the line "X-Y" and remove the triangular area "X-S-Y" of the model by thrusting the back of the saw blade anteriorly in the direction of the central incisors (Fig. 26).

5. Draw a new line parallel to line "X-Y" about one-half inch anterior to it. Mark off the triangles and repeat as before.

Continue the process until the model is completely removed from the denture. The entire procedure takes about 5 or 10 minutes!

Inserting the Denture—The patient is anesthetized, either a local or general anesthetic being used. The remaining natural teeth are removed and the denture inserted immediately.

Instructions to Patient—The patient is placed on a 9-day diet consisting of three 3-day periods: (1) fruit juices (to promote healing), hot beverages, hot clear soups; (2) fruit juices, hot beverages, hot soups, hot semi-solid foods; (3) fruit juices, hot beverages, hot soups, hot semi-solid foods, raw vegetable and fruit salads.

The patient should attempt no solid or crunchy foods until after the completion of the diet.

Don't forget to polish the denture after the ninth day!

Advantages

1. Esthetics. The patient's facial expression is unaltered due to the fact that the denture is inserted immediately after the extractions.

2. No edentulous period. Because the denture is inserted while the patient is still anesthetized, the patient never experiences an edentulous period.

3. Eliminates trimming the process. Because of the plasticity of the denture base material at the time of in-

sertion, it is not necessary to perform radical bone resections in order to seat the denture.

4. Minimizes bone resorption. Because the exposed surfaces of the blood clots in the sockets are convex (due to the shape of inner aspect of the denture) rather than concave, there is less bone resorption.

5. Minimizes postoperative pain. That portion of the denture which will cover the sockets is coated with a medicated ointment before the denture is inserted.

6. Minimizes sore spots. Because the denture is actually molded to the mouth, there are virtually no sore spots.

7. Balanced occlusion. Due to the plasticity of the denture base material, the individual teeth can be retained in a corrected and balanced occlusion by normal biting pressure.

8. No clear acrylic splint. Inasmuch as the denture is in a pliable state at the time of insertion, it will conform to the shape of the underlying structures. The purpose of the clear acrylic splint is to enable the oral surgeon to fit the mouth to the denture. With this technique, the denture is fitted to the mouth, not the mouth to the denture.

Precautions

1. Porcelain teeth cannot be used. Because the retention of porcelain teeth is achieved solely by means of a *mechanical* union, the plasticity of the plastic denture base material may jeopardize the ultimate retention of these teeth when the denture is inserted. Plastic teeth *must* be used, for their retention is achieved by means of a *chemical* union between the tooth and the plastic denture base material.

2. Vulcanite cannot be used. Vulcanite cannot be used as the denture base material in this technique as it must be processed under steam pressure (vulcanization).

3. Cannot be used for mandibular dentures. This technique is not advocated for the construction of full lower dentures because of the possibility of distortion in the posterior.

Prerequisites

1. Selected patients. The technique should be explained to the patient in advance. His or her whole-hearted cooperation must be insisted upon before the procedure is started.

2. Anatomic articulator. Because of the plasticity of the acrylic when the denture is inserted, there must be virtually no premature contact in either centric or eccentric movements of the mandible. Such contact may derange one or more teeth and thus disturb the alinement. This can be avoided by using an anatomic articulator when setting up the teeth.

3. Ejector-type flask equipment. This equipment makes it possible to retrieve the case in the shortest possible time and with the least possible danger to the case. *Never try to remove the case by digging it out of the flask!*

839 *Main Street.*

Fixation in Maxillofacial Fractures

(*Continued from page* 161)

ing interdental traction were removed.

Sixth Day: An external nasal splint pattern, fashioned directly in baseplate wax on wire, was obtained and given to a prosthetic technician to be processed in clear acrylic. The completed splint (object at lower left in Figure 1; also see Figure 5) was placed to maintain the correct position of the nose following reduction of the bilateral fracture sustained at the time of injury. The nasal splint was attached to the anterior arm of the device by securing the wire extension in the set screw arrangement of the central protuberance.

Twenty-fourth Day: By this time a sufficient bony union had been established to permit the removal of all external apparatus and the patient was discharged from the hospital. Her response to treatment and her attitude toward recovery were most gratifying.

Comments

It is realized that there are differences of opinion concerning most subjects and procedures. However, the advantages in the use of the appliance described herein are so obvious and far-reaching that the problematic dangers of (1) injury through falling by an ambulatory patient and (2) infection developing in or about the incisions, should hardly be mentioned. Such dangers attend any surgery or orthopedic surgical treatment. An attitude of arbitrary negation or of defeatism should be tempered by experience which can only be gained, of course, by participation in or observation of correct operative procedure. The feelings of security, comfort, and confidence expressed by patients are also convincing evidence of the efficacy of this method.

Crawford and Bloom have made a truly notable contribution to the advancement of oral surgical treatment by their foresight, ability, and effort in the designing and production of the fracture fixation device described in this article.

Dental Department, Camp Pendleton.

Repairing BROKEN FACINGS *with a Modified Acrylic Crown*

JULIUS MICHMANN, Dr. med. dent., Jerusalem

DIGEST

The adaptation of the well-known technique of acrylic crown preparation to the repair of broken facings, in cases of weak or missing incisal edges, is described. This type of treatment is not applicable to all such cases, but in suitable circumstances it may achieve satisfactory functional and esthetic results.

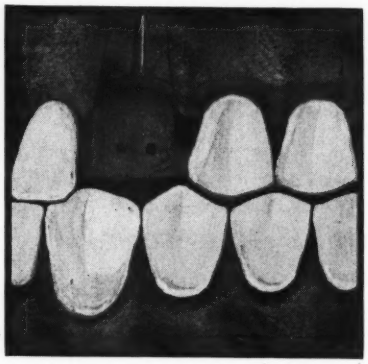
A modified acrylic crown, similar to a ferrule crown restoration, is used to replace the weak or missing incisal edge.

CARE IN adapting backings to porcelain facings in fixed bridges prevents many accidents which necessitate the repair of broken facings or even removal of a whole bridge. Despite care, however, facings sometimes have to be replaced in the mouth of a patient.

Weak or Missing Incisal Edges

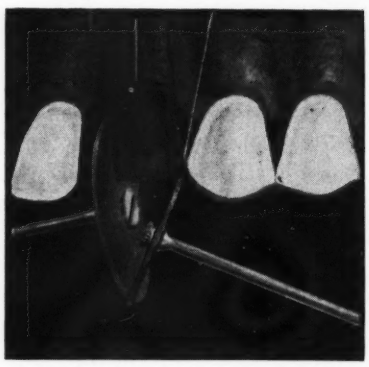
Most broken facings may be dealt with by simply adapting a new porcelain facing or processing an acrylic one; but broken facings with weak or missing incisal edges are rather difficult to repair satisfactorily. The use of a modified acrylic jacket crown has been found most practical for repairing many of these. The technique is simple and may be performed by any dentist who is familiar with usual jacket crown preparation.

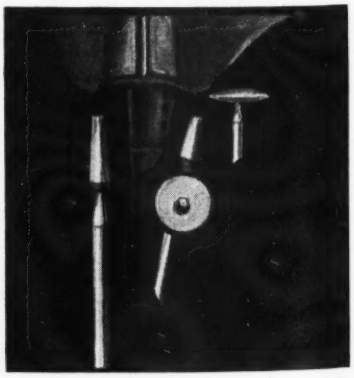
(Short bite cases and those with unsuitable backings cannot be treated by the following method, but an acrylic metal combination may be applied to them.)



1. ***Backing cleaned; thin incisal edge shortened.***

a





2. ***and*** **3.** ***Backing for a broken abutment facing converted into a core with full shoulder by means of small stones. (a) Shallow but well-defined notch made with carborundum disc at soldering joint of bridge for occlusal retention.***

Technique

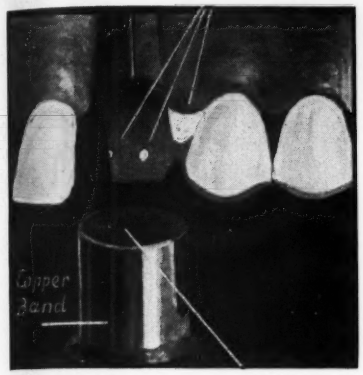
1. The labial or buccal surface of the backing is cleaned of broken porcelain and/or cement particles and metal pins, if any. The thin incisal metal edge is then removed by shortening the backing, allowance being made for occlusal clearance (Fig. 1).

2. In the case of a broken abutment facing, the backing is converted into a core with a full shoulder by means of carborundum discs and small stones (Figs. 2 and 3), exactly as in the preparation of a porcelain jacket crown of the shoulder type.

3. If necessary, the labial or buccal shoulder should be deepened slightly below the gingival margin, even if by doing so the metal base of the abutment piece is damaged.

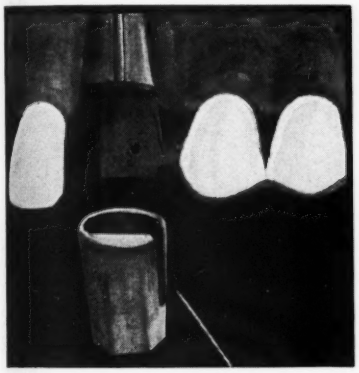
4. To obtain proper occlusal retention against displacement by masticatory pressure, a shallow but well-defined notch is made at the soldering joint of the bridge with a carborundum disc (a in Fig. 2).

Gutta percha



Modeling compound or alginate impression material

4. *Interdental space of bridge next to core and pin holes filled with gutta percha, flush with preparation, to avoid distorting modeling compound or alginate impressions.*



Cement-covered tin-foil matrices

5. *Tin-foil matrix burnished over die and strengthened with a cement cover before plaster of paris impression is taken.*

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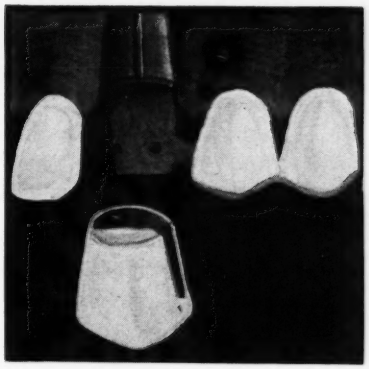
5. Before taking a copper band impression with modeling compound or alginate impression material, fill the interdental space of the bridge next to the core as well as the pin holes with gutta percha flush with the preparation (Fig. 4). This step avoids distortion of the impression. Then make a stone model from the modeling compound or the alginate impression and burnish a tin-foil matrix over the die. (This procedure is similar to that followed in the adaptation of platinum foil to a porcelain jacket crown model.) The tin-foil matrix is strengthened by a cement cover and put on the core before the plaster impression is taken (Fig. 5).

Usually the cement-covered tin-foil matrix remains in the plaster of paris impression, especially if it is properly shaped and has pronounced edges; but if it does not remain, it may easily be fixated. The advantage of using the tin-foil matrix is that it assures exact placement of the core model in the plaster impression before the cast is poured.

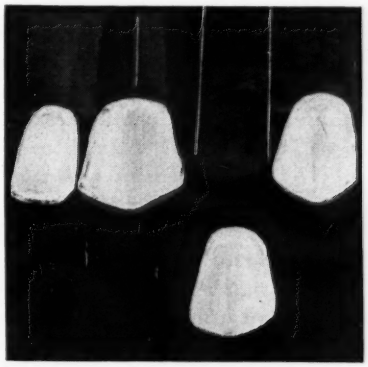
6. A wax bite taken from the core and the adjacent teeth provides the necessary data for determining the contact point and the height of the replacement.

7. Processing the modified acrylic jacket crown according to model and color and cementing the finished crown do not involve any particular difficulties and do not, therefore, require any further explanation (Fig. 6).



6. *Modified acrylic jacket crown after processing, ready for cementation.*

a b



7. *In repairing broken pontic facings, solder joints of bridge (a,b) should not be weakened unnecessarily. Crown should be rather bulky to withstand mastication despite weakening effect of mesial and distal openings.*

Broken Pontic Facings

By an appropriate modification of the above-mentioned method (in which, however, a shoulder cannot be prepared), it is also possible to repair broken pontic facings (Fig. 7). In such cases, much care should be taken not to weaken the soldering joints of the bridge more than is absolutely necessary (a and b in Fig. 7) and to ensure a rather bulky crown which cannot easily give way under pressure of mastication despite the weakening effect of the mesial and distal openings.

To avoid undue stress and possible breakage of the restoration, special attention should be given to complete freedom of articulation, the importance of which cannot be overemphasized.

8 *Ratisbon Street.*

Differential DIAGNOSIS OF CYSTS *in the Anterior Maxillary Region**

GEORGE A. MORGAN, D.D.S., Toronto

DIGEST

A problem in the diagnosis of oral conditions is to differentiate from each other the cysts commonly occurring in the anterior maxillary region. Incisal cysts may be confused with radicular cysts or dentigerous cysts; or, they may not be distinguished from anterior palatine fossae.

It is indicated in this brief orientation that supplementary roentgenographic study will serve to identify the type of cyst present.

THE MOST commonly misinterpreted differential diagnostic problem involving the anterior maxillary region probably concerns cysts. This circumstance is due in part to the fact that dental literature contains few references to differential diagnosis of cystic conditions in the anterior maxillary region.

The types of cysts most frequently observed in this region are: (1) incisal cysts, (2) radicular cysts,[1] and (3) dentigerous cysts.[1]

Incisal Cysts

These are situated in the incisive canal. Their incidence is not less than one in every hundred cystic cases.

Nature of—Incisal cysts are supposedly derived from epithelial remanents which persist in the interincisive region. Pathologic sectioning reveals that the membrane lining them is ciliated, transitional, and squamous epithelium. This finding demonstrates that in part at least these cysts belong to the nasal structure.

Location—The majority of incisal cysts lie well within the anterior palatine canal. It is therefore difficult to distinguish roentgenographically between incisal cysts and the anterior

1. ***Occlusal roentgenogram, large incisal cyst (maxillary median line cyst) which has invaded the palate. Note division of cyst by median line suture.***

*This is the first in a series of articles by Doctor Morgan on problems in differential oral and dental diagnosis.

[1]Morgan, G. A.: Oral Tumors of Dental Interest: The Cyst, THE DENTAL DIGEST 50:362-365 (August) 1944.

2. ***Occlusal roentgenogram, large radicular cyst which has invaded the palate. Note cyst is to one side of median line suture.***

palatine fossae. When the cysts are displaced laterally, as roentgenograms taken in the anterior lateral position frequently show them to be, they may be superimposed over the lateral incisor roots. In this position incisal cysts may easily be mistaken for radicular cysts.

Clinical Significance—Incisal cysts which are limited in size are considered to be without clinical significance. Frequently, however, they become infected, enlarge, and, breaking down the walls of the anterior palatine fossae, invade the palate. Probably some of the median line cysts of the maxilla, whose etiology is obscure, should be classified. In many instances, they have been known to exert sufficient pressure on the anterior palatine nerve to produce considerable pain.

Differentiated from Dentigerous Cysts—Cysts of the dentigerous type, observed in the anterior maxillary region, are associated with either impacted or supernumerary anterior teeth. Pathologically, dentigerous cysts contain but few round cell infiltrations. They are therefore likely to be characterized as noninflammatory.

Roentgenographic Study

Probably the best aid in the differential diagnosis of cysts in the anterior maxillary region is an occlusal roentgenogram to supplement the customary intra-oral dental roentgenogram of the maxillary central incisors. Incisal cysts will generally be observed to be spherical and divided by the median line suture as illustrated in Figure 1; radicular and other cysts or infected areas around centrals or laterals, on the other hand, tend to be situated to one side of the nasal spine, as illustrated in Figure 2.

170 *St. George Street.*

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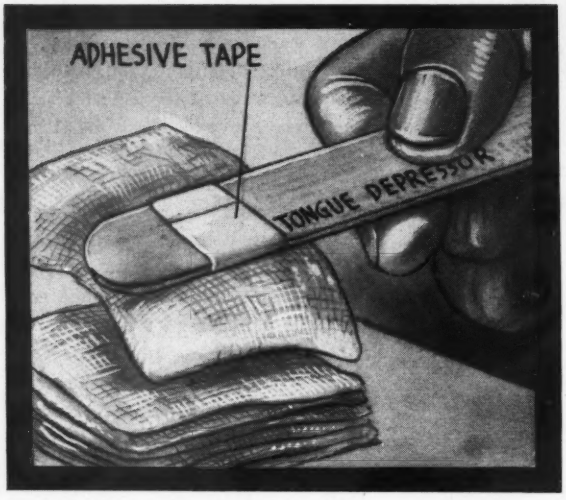
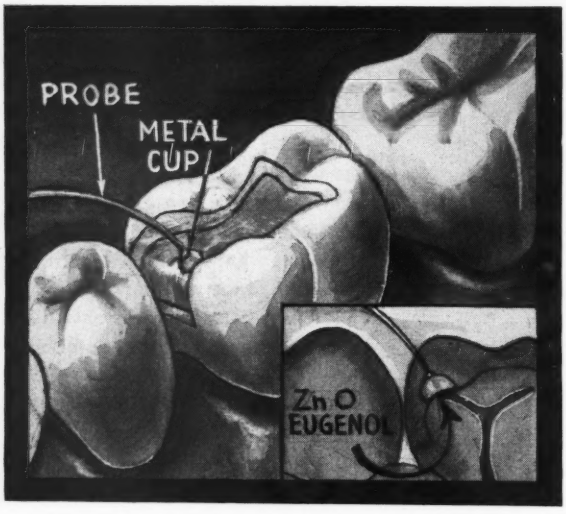


1

A Method for Picking up Surgical Sponges

P. J. Spector, D.D.S., Brooklyn

1. To eliminate contaminating 6 x 6 sponges, use a tongue depressor around which has been wound a one inch strip of adhesive tape. When applied to a pile of sponges, the adhesive will pick up only the top sponge from the pile without contaminating the remainder.



2

A Method of Pulp Capping to Avoid Pressure

W. G. Roberts, B.D.S., Hamilton, New Zealand

2. In the accidental exposure of a pulp in a young patient, the tissue may be capped by using a cup of thin aluminum or gold. The cup may be formed by modifying the shank of a rubber dam punch so that the cutting point is changed to a rounded contour. The metal cup is filled with a mixture of zinc-oxide and eugenol and attached lightly with wax to a metal probe. The cup is carried to place over the exposure and the wax attachment is gently broken. Cement is flowed over the metal cup. This method prevents direct pressure upon the exposure.

3

Improved Amalgam Restorations

Alan L. Teitel, D.D.S., New York

3. A metal matrix, either a full or a semi-band, is adapted and ligated in position with dental floss. A separator is used on the part of the band where the restoration is to be placed. The separator assures proper separation, close gingival adaptation of the band, and a good contact point.

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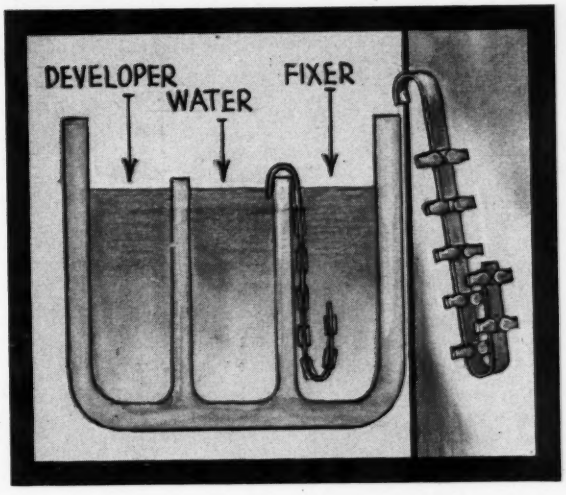
UGGESTIONS . . .

Processing Roentgenograms in a Small Tank

Howard S. Rhyne, D.D.S., Gastonia, North Carolina

4. Where a half-gallon developing tank is used, fourteen films cannot ordinarily be processed on one hanger because the tank is too shallow. To overcome this objection, a number 4 Eastman developing hanger may be bent below the fifth row of clips. The half-gallon tank will then accommodate fourteen films on one hanger.

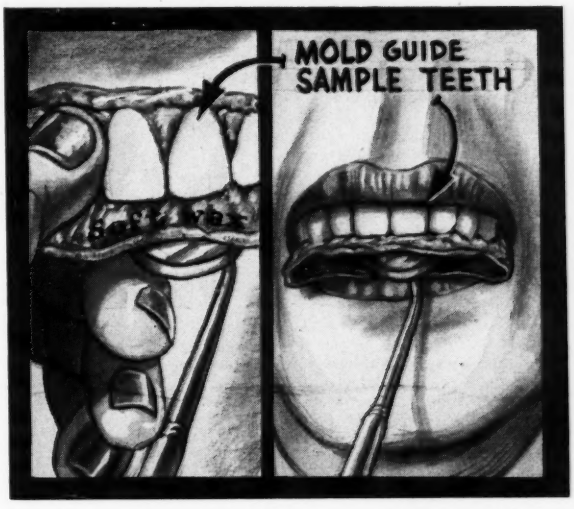


4

Use of Mold Guide Samples in Tooth Selection

Jack M. Breuer, New York

5. A convenient method of trying in mold guide samples to assure proper contour and lip relationships is to set the teeth in soft wax around the head of a mouth mirror. The mirror can be placed in the mouth which will give an accurate idea of the esthetics of the finished denture.

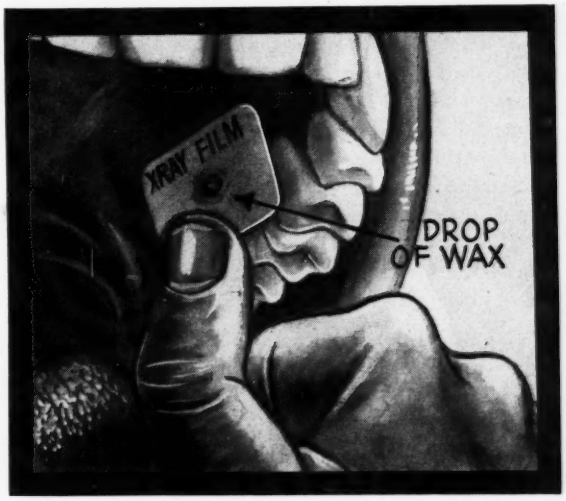


5

Centering an X-ray Film

Herbert E. Williams, D.D.S., Red Bank, New Jersey

6. Place a drop of wax on the center of the x-ray film. This serves as a positive guide for the finger of the patient in centering the film.



6

suitable illustrations; write a brief description of the technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 180 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

Preparing the Bite-rims for the Setup

Frank R. Holmes, D.D.S., Eastport, Maine

7. This is a procedure planned to avoid the burning of fingers and the annoyance of dropping teeth when setting them against a shellac baseplate.

1. Make a pink wax baseplate for the model (Figs. 1 and 2). Then lay the wax baseplate aside and fit a regular shellac base to the model (Figs. 3 and 4).

2. Replace the pink wax on the model. Warm the baseplate slightly and fit smoothly *over the wax* (Figs. 5 and 6).

3. Make up a beeswax bite over the whole ridge; proceed with the bite in the usual manner for a full upper or lower denture.

4. After the case is mounted and set on the articulator (Fig. 7), remove the beeswax from one side or both sides with a warm knife.

5. Score the baseplate with a warm, sharp knife or knife edge stone at a place on the ridge slightly lingual to the position of the teeth and pins to be set up (Fig. 8).

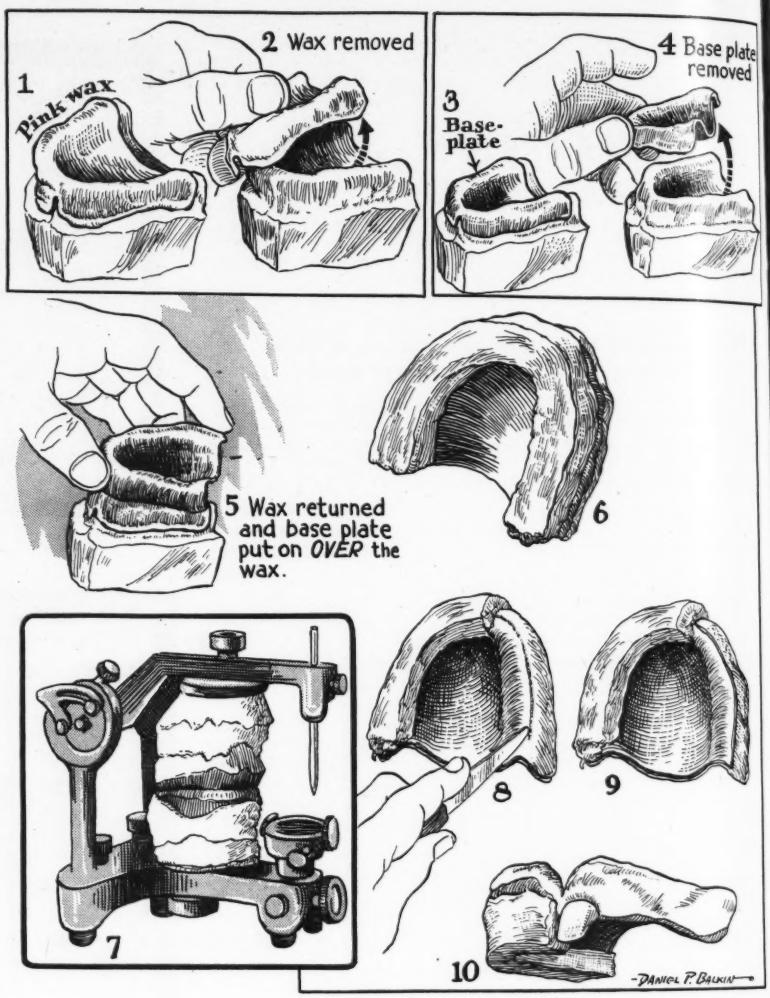
6. With a knife, break the labial and lingual portion of the outer baseplate previously scored, leaving the palatal portion intact (Fig. 9). A layer of pink wax then remains over the labial and buccal area on one side of the model.

7. Proceed to set up teeth on the pink baseplate (Fig. 10), taking care not to stick the wax, used in attaching the teeth, to the shellac baseplate. The single layer of pink wax on the labial and buccal ensures the uniform thickness of the denture.

This procedure is particularly good in short bite cases; it leaves a trial plate amply rigid for a try-in. After the try-in, if everything is in order and a thin denture is desired, remove the outer baseplate from the palatal portion with a corner of a knife. If for any reason a thicker denture is required, wax may be added to the palatal baseplate.

Another method is to run a little pink wax over the palate or in those places where thickness is required—after removing the shellac baseplate.

(The scoring of the shellac baseplate may be done prior to fitting beeswax on the model.)



Pathogenic Lactobacilli

LACTOBACILLI are usually regarded as nonpathogenic except for their association with dental caries; in fact, some members of this genus have been considered beneficial, particularly in the intestinal flora. Two cases studied by South American investigators, however, show the need to keep lactobacilli in mind in the bacteriologic diagnosis of endocarditis.

Sepsis with Endocarditis

Two patients suffered from a slowly progressive disease of from two to three months' duration. Similar clinical features involved in both were:

1. Previous cardiac involvement.

2. Recent dental lesions. (One had had a fistula and abscess; the other a multiple extraction for granulomas.)

The disease began with a "cold;" about two months later there was continuous high fever, and finally valvular involvement which brought on death. Although the cases were similar clinically, they were widely separated geographically and as to time of occurrence.

Ten strains of lactobacilli isolated from these cases were carefully studied and later were inoculated into mice and chicken embryos for further study. The authors formed the opinion that these lactobacilli had a moderate degree of virulence.

Conclusion

The clinical severity of the two cases is believed to have depended on the localization of the infection on previously damaged heart valves rather than on the invasiveness or toxicity of the organisms.

—From Current Comment, *Journal of the American Medical Association* 135:1076 (December 20) 1947.

The EDITOR'S *Page*

EVERY YEAR more fundamental research is being directed toward the solution of the cancer problem. It is encouraging to observe that biologists, rather than clinicians, are now taking their places in the front ranks of cancer research. Although all studies are directed toward ultimate clinical application; namely, toward the prevention and treatment of malignant disease, the fundamental studies of cellular behavior must precede the clinical approach.

To treat any disease process without an understanding of the basic laws of cytology is to practice empiricism. To be sure, many of the successful treatments in dentistry and medicine are purely empiric. But that is no reason why we should not be forever anxious to uncover the fundamental facts of cellular behavior that underlie all disease and all treatment.

In a stimulating paper, E. V. Cowdry, Professor of Anatomy, Washington University, St. Louis, has made an important evaluation of cancer research.[1] As a cytologist, he expresses the possibility of controlling cancer by the use of antibiotics. Antibiotics, as he classifies them, are of two kinds—"foreign" and "domestic." The "foreign" are represented by those substances produced by or from lowly organisms *outside the body* which are antagonistic to bacteria and perhaps to cancer cells. Penicillin is a classic example of this kind of antibiotic.

In describing the "domestic" antibiotics that are generated *within the body*, Cowdry pictures a substance or substances that are contraceptive to cellular reproduction and division. Apparently the human organism has within it the power to manufacture substances that regulate and control cell growth and differentiation. If it were not for such a mechanism, our bodies would grow in size without limit with organs and tissues disproportionate in size for their function. This growth-limiting biologic phenomenon is part of Cannon's classic concept of hemostasis, the self-regulating and adjusting feature of the organism.

If there can be found antibiotics or chemical substances of nonbiologic origin that will control malignant cell growth, a promise is held for some measure of cancer control. As Cowdry says, "Cancer cells must be vulnerable to something. Their armor cannot be impenetrable."

When Cowdry writes of the speed of cancer growth, we are brought face to face with basic observations of cellular metabolism:

"All of us have had friends die of cancer much more slowly than was predicted. Yet some cancers have progressed like wild fire, much faster than was expected. We have seen small primary cancers metastasize extensively and large ones of the same variety spread but little. Within a single individual a cancer sometimes grows, then enters a period of quiescence, and enlarges again. Very rarely a cancer disappears altogether for no apparent reason. These observations suggest the occasional operation within the body of influences antagonistic to the cancer cells. These influences can be called 'domestic' antibiotics since they are probably produced by cells belonging to the same community as the cancer cells. On the chance that they can be mobilized and their action directed, it becomes our duty to intensify the search for cancer cell antagonists."

The rate of advance of any disease process is unpredictable. The progress of dental caries or periodontitis is a variable in the same terms as any other pathologic condition. These diseases may be "slow" or "fast," depending on the type of tissue cells and the response of these cells to stimulation and irritation.

Cowdry writes with some hopefulness but without undue optimism on the future of cancer control: "By its very existence every cancer has a running start on its victim. It can never be diagnosed at the moment the malignant transformation takes place. We cannot expect diagnosis to improve to the point that every cancer will be recognized in time to be cured by known methods of therapy. Many which are sharply localized can be removed by excision and destroyed by radiation, but Hodgkin's disease and the leukemias are widely distributed when first recognized. In their case the malignant change may not be restricted to a small focus. The great question is: Can we expect therapy to improve to the point where all cancers, even those which have spread throughout the body, will be curable?"

[1]Cowdry, E. V.: Expectations in Cancer Research, Proc. Inst. M. Chicago **17**:30-38 (February 15) 1948.

MEDICINE and the Biologic Sciences

Postoperative Pulmonary Embolism

Statistics derived from thousands of surgical patients surveyed in several large surgical clinics in the United States show that approximately one out of every 1,100 postoperative surgical patients dies from fatal pulmonary embolism. This death rate is not excessive yet it warrants consideration toward its reduction.

The means taken to combat this post-surgical possibility are roughly divided into three types. The first is largely preventive and includes the *perfect preparation of the patient for surgery*. The patient's physical condition should be the best possible and the various elements of the blood should be brought up to normalcy. The operation should be done gently, carefully, and with complete hemostasis. Whenever possible, nonabsorbable sutures should be used. Early ambulation is encouraged as there is definite evidence to show that this decreases thrombo-embolic phenomena. Abstinence from tobacco both preoperatively and postoperatively, in order to avoid the vasospastic effect of tobacco, is wise.

The second plan of treatment calls for the *use of anticoagulants*. The intelligent use of dicumarol and heparin has decreased the incidence of thrombo-embolism to a negligible percentage. The one drawback of this treatment is the varying sensitivity of patients to the drugs. Where sensitivity is great, the prothrombin and coagulation times may be so lengthened that resultant wound and internal hemorrhage can occur.

The third plan of treatment consists of *various vein ligations* as advocated by some surgeons. The veins most frequently ligated are the superficial femoral, just distal to the profunda; the common femoral, the iliac, or even the vena cava. This plan of treatment is not widely used as the greatest number of thrombo-embolic deaths occur without any warning. Therefore, it is impossible to determine just when ligation should be done.

The operations in which thrombo-embolism is most apt to develop are those on the uterus, bladder, prostate, rectum, colon, gangrenous appendices, biliary tract, and hernias in obese subjects. With these, excellent preparation of the patients, meticulous surgery, and early ambulation are of value in preventing thrombo-embolism. In selected operations dicumarol therapy has a definite place.

Mustard, R. L.: Postoperative Pulmonary Embolism, J. Michigan M. Soc. 46:821 (*July*) 1947.

Headache

The symptom of headache is probably encountered more frequently than any other symptom. It carries with it mental anxiety as well as physical discomfort. Headache is found as a part of many conditions, functional as well as organic. And frequently, unless the cause is obvious, it is passed over and other symptoms often less annoying to the patient are given chief attention and treatment.

Usually headache is a purely subjective symptom so that its cause is difficult to determine. It is necessary to discover the character and mode of production of each headache as an individual entity before its cause can be diagnosed and treated.

There are certain structures in the head that are pain-sensitive. The tissues covering the cranium, especially the cranial arteries, are sensitive. Also, certain intracranial structures —(1) parts of the dura mater, (2) the dural arteries, (3) the venous sinuses and some of their tributaries, and (4) the cerebral arteries at the base of the brain—are sensitive. Certain nerves that carry pain to consciousness are pain-sensitive. These are the sensory branches of the fifth, ninth, and tenth cranial nerves and the first, second, and third cranial nerves.

In contrast to these pain-sensitive structures there are others definitely not pain-sensitive. Among these are the cranium itself, the parenchyma of the brain, the pia, arachnoid, and most of the dura, the ependymal lining of the ventricles, and the choroid plexuses.

Physiologically, headaches are produced in four principal ways. Clinically, however, headaches are seen as combinations of the four ways. These ways are: (1) distention and dilation of arteries inside or outside the skull (mostly by branches of the internal and external carotid arteries): (2) traction on the vessels within the skull; (3) edema and spasm of muscles of the scalp and neck, and (4) direct irritation of pain-carrying nerves or structures by inflammation or pressure.

When a patient complains of headache, it is wise to determine the severity of the complaint as this is valuable in finding the cause. Severe headaches result from tic douloureux, vascular stimulation (as seen in migraine and histaminic cephalagia), and inflammation within the cranium as noted in meningitis, encephalitis, and brain abscess.

Moderately severe pain results from drainage headache, neuralgias of the scalp (including toothache), earache, sinusitis, and traumatic headache

which may be severe or mild. Mild headaches suggest tumors of the brain, eye strain, toxic headache (including hypertension), tension, and psychic headache.

There is evidence that excessive histamine production from an allergic reaction causes a characteristic type of headache in some persons. This is dealt with by determining and eliminating the source of allergy, desensitizing the patient to the specific substance demonstrated to be causing the allergy, and/or increasing the tolerance to histamine.

Of particular interest to the dentist are the extracranial headaches. They are really head pains rather than headaches because of the sensory distribution of the fifth, ninth, and tenth cranial and upper cervical nerves.

They vary in severity from a mild myositis to the severe pain of earache to tic douloureux. Otitis media or pressure of glands on branches of the trigeminal nerve will cause severe pain. Drilling in cavity preparation and pulpitis may cause headache. Tonsillitis, Vincent's infection, and other conditions of the mouth and throat may be felt as pain along the ninth and tenth nerves. These are extracranial and organic but cause great discomfort until recognized and treated by local or general therapy.

Butler, Stuyvesant, and Thomas, W. A.: Headache, J.A.M.A. 135:967-971 (*December* 13) 1947.

Mortality in Premature Birth

A premature infant, according to the American Academy of Pediatrics, is one born alive who weighs 2,500 grams (5 pounds, 8 ounces) or less and whose heart beats. This definition must be rigidly adhered to in all reports and tabulations. No lower limit of viability is allowed.

Prematurity is a leading cause of death in the United States. Premature birth takes a higher toll of infant life than any other pediatric condition. It is one of the ten leading causes of death among the general population. In 1944, the most recent year in which figures are available, 33,120 infants died of prematurity. Of these 32,065 died during the first month of life (the neonatal period).

There is a gradual lowering of the death rate from prematurity. In 1944 infants born prematurely in the United States enjoyed about a 20 per cent better chance for survival than those born in 1934.

More than one half of the deaths occur during the first twenty-four hours. Therefore, measures are being directed against the dangers of this first twenty-four hour period.

Mortality from premature births is being reduced in two general ways: (1) an actual over-all reduction in the incidence of premature births; (2) an improvement in the methods of care of the premature infant after birth.

The majority of deaths during the first twenty-four hours are due to accidents associated with birth—most frequently, trauma and asphyxia. These mishaps are predominant among infants who weigh less than 1,500 grams (3 pounds, 5 ounces). Prolongation of intrauterine life so that the infant's weight will fall within the higher weight groups is a prime objective.

General measures to avoid premature birth with its complications include adequate supervision of the hygiene of pregnancy and proper advice concerning diet, coitus, rest, and exercise. Early discovery of the presence of syphilis and its vigorous treatment throughout pregnancy is necessary. Prevention of congestive failure in cardiac disease is important.

Determination of the size of the child by means of the roentgen ray reveals valuable information as to how to deal with the problem. It is wise to eliminate morphine, scopolamine, barbiturates, and general anesthesia in all labors in which prematurity is involved. Along with these precautions vitamin K should be administered to the mother before pregnancy is interrupted. Also, vitamin K should be given to all premature infants immediately after birth.

In the larger hospitals special measures are taken to care for all premature births at all times. A heated crib is available with facilities for resuscitation and the administration of oxygen in readiness. Oxygen is administered to all prematurely born infants during the first hours after birth. Often a bronchoscopy is necessary immediately to ensure breathing.

Rigid steps should be enforced to prevent infection of any type as these infants are highly susceptible and have a low resistance to infection. Careful hematologic studies are routine with special emphasis on the Rh typing and agglutinations.

The records of institutions employing special measures for the premature infant are gratifying. Not only are there fewer deaths but the individual baby has a much more favorable chance for survival toward normal growth and development.

Koch, L. A., Weymuller, C. A., and James, Elizabeth: Reduction of Mortality from Premature Birth, J.A.M.A. 136:217-221 (*January* 24) 1948.

Effect on the Teeth of Taking Iron

For years the opinion prevailed that the taking of tincture of ferric chloride or other forms of iron was injurious to the teeth. This probably arose from the fact that staining of the teeth developed unless the solutions of iron were taken through a tube and swallowed without their coming in contact with the teeth.

A review of recent periodical medical and dental literature offers little information on the effects on normal teeth or metallic fillings and restorations of taking iron in any of the various forms used in therapy. There appears to be no laboratory or clinical evidence to justify the opinion that iron is harmful.

Research men and biochemists now discount or minimize the formerly held opinion that iron therapy results in injury to teeth other than the staining of the teeth. The iron

does cause a varying amount of staining; however, this can be removed to a large degree by immediate brushing.

Queries and Minor Notes, Effect on the Teeth of Taking Iron, J.A.M.A. 135:20 (*December* 20) 1947.

Penicillin—Blood Levels

Penicillin therapy is an accepted adjunct to many dental operations today. This is especially true since the advent of oral administration of penicillin. Recently a new drug, caronamide, has been given orally in conjunction with penicillin. This produces a physiologic and reversible inhibition of the excretion of penicillin with a resulting elevation of the concentration of penicillin in the plasma.

Most authorities agree that the attainment of a high concentration of penicillin is desirable. It is difficult to attain elevated concentrations because of the rapidity with which penicillin is absorbed from the site of injection or administration and excreted by the kidneys.

Normally, about 80 per cent of penicillin in the urine is excreted by the renal tubules and only twenty per cent by glomerular filtration. Therefore, an agent to suppress the tubular excretion of penicillin should be of value. High plasma concentrations of either iodopyrin or para-amino-hippuric acid completely suppress the excretion of penicillin by the tubules. However, such large amounts are necessary that their routine use is not practical.

It was noted that caronamide produces a reversible inhibition of penicillin excreted by the renal tubules. It is effective orally with only a low toxicity, if any at all. Two grams of caronamide administered orally every four hours maintains a penicillin blood level from two to seven times higher than that achieved by the oral administration of 100,000 units of crystalline sodium penicillin G in aqueous solution alone.

These preliminary studies indicate that caronamide produces an elevation of penicillin plasma concentration when penicillin is administered either orally or intramuscularly. Also, the drug favorably influences the plasma concentration following the administration of penicillin in beeswax and oil.

At present there is no optimal dosage schedule. However, it can be stated that from twofold to sevenfold enhancement of plasma concentration may be anticipated if from 1.5 to 2 grams of the drug are given concomitantly with penicillin every three or four hours respectively.

There have been no reports of systemic toxicity in the patients receiving the drug. The drug gives promise of great therapeutic usefulness in conditions requiring penicillin. It should serve to make available more of the penicillin administered and to maintain high penicillin blood levels where needed.

Crosson, J. W.; Boger, W. P.; Shaw, C. C., and Miller, K. A.: Caronamide for Increasing Penicillin Plasma Concentration in Man, J.A.M.A. 134: 1528-1532 (*August* 30) 1947.

Fat-Soluble Vitamins

Because of widespread publicity and advertising there is a great deal of vitamin medication today. The fallacies of vitamin medication have to do more with the choice and lack of proper indications rather than the possible damages. In general the vitamins are devoid of direct toxicity even though they are biologically very active. Vitamins A and D are the only vitamins which, in overdosage, may produce specific toxic manifestations. These are fat-soluble vitamins.

Vitamins in the fat-soluble group are A and its provitamin, the biologically active carotenoid; vitamins D, K, E, and to some extent the essential unsaturated fatty acids such as linoleic and arachidonic acids.

The toxic dose of vitamin A is far above the usual therapeutic dose; therefore, there is little or nothing concerning hypervitaminosis A recorded in clinical literature.

The possibility of clinical hypervitaminosis D is great. The large doses currently often used in and recommended for various conditions such as arthritis, lupus, scleroderma, and tetany are very close to the toxic limit. This fact should be remembered in using large doses of vitamin D.

The earliest and most pronounced symptoms of intoxication originate from the digestive system. Anorexia, nausea, vomiting, abdominal cramps, and diarrhea are common. Frequently neuralgia, pain in muscles and joints, dizziness, headache, muscular weakness, laziness of memory, and occasionally numbness and tingling in the extremities are noted.

More severe signs include renal failure, demineralization of long bones, and metastatic calcifications of soft tissues including vessels and various organs.

Small doses of vitamin D have a marked influence on the resorption of calcium from the intestinal canal. In contrast, excessively large doses mobilize the calcium from the bones and the resorption-increasing effect is not demonstrable.

There is no vitamin D preparation which is devoid of toxicity when given in large doses. In the recommended doses of 200,000 units daily given for a prolonged period, toxic manifestations are a relatively common occurrence. The potential toxicity is enhanced by a diet rich in calcium, such as the predominantly milk diets of infants.

The American Rheumatism Association states that large doses of vitamin D are of doubtful value in the treatment of arthritis and do not seem to alter the ultimate course of the arthritic process.

Under normal dietary conditions, vitamin D has to be supplied as a separate supplement only in usual therapeutic or prophylactic doses of 400 to 800 units daily (or provided by direct irradiation) for infants, children, and pregnant women. The requirements for the rest of the fat-soluble vitamins are, as a rule, well covered by the diet. Intestinal syn-

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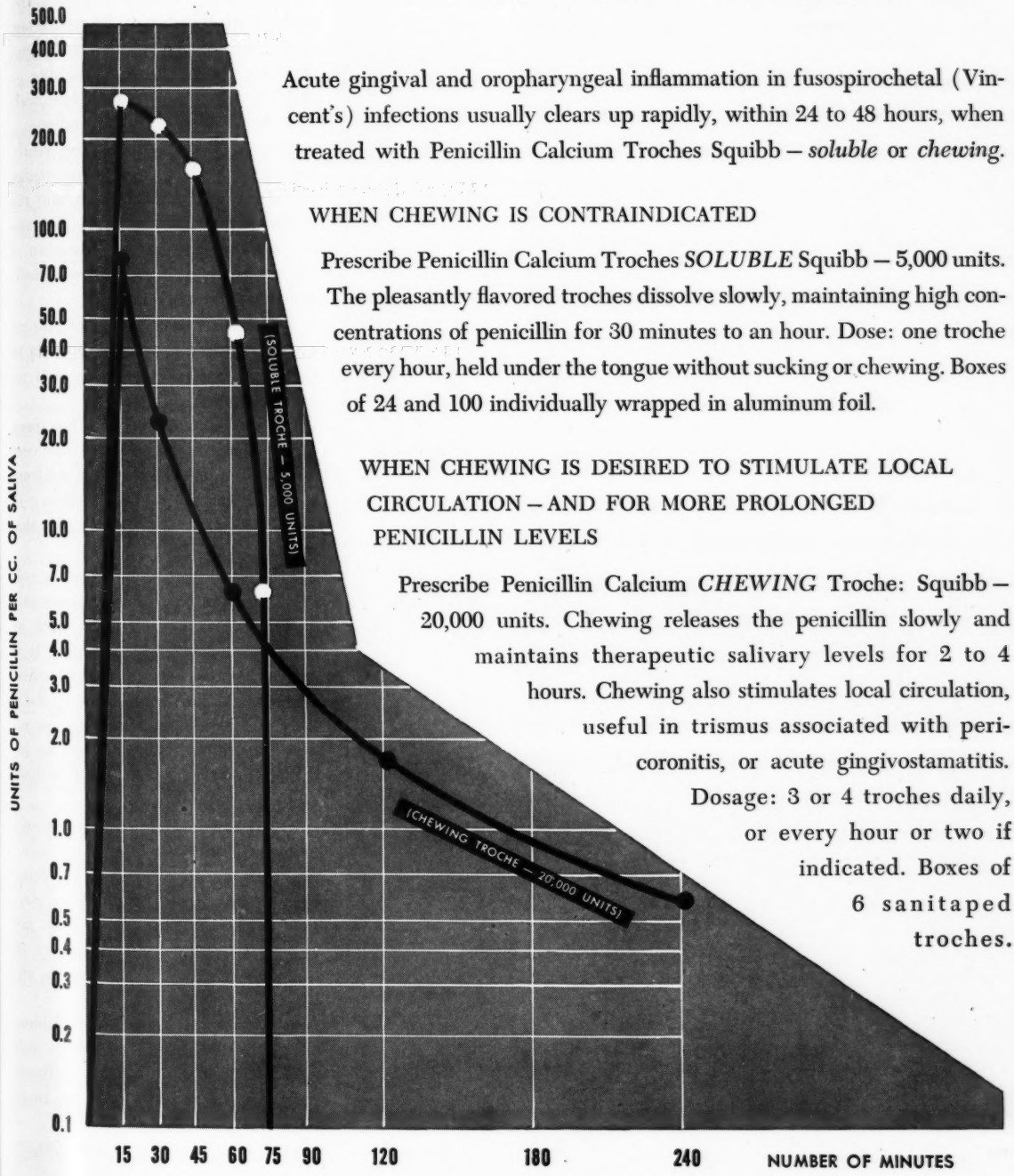

Acute gingival and oropharyngeal inflammation in fusospirochetal (Vincent's) infections usually clears up rapidly, within 24 to 48 hours, when treated with Penicillin Calcium Troches Squibb — *soluble* or *chewing*.

WHEN CHEWING IS CONTRAINDICATED

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WHEN CHEWING IS DESIRED TO STIMULATE LOCAL CIRCULATION — AND FOR MORE PROLONGED PENICILLIN LEVELS

Prescribe Penicillin Calcium *CHEWING* Troche: Squibb — 20,000 units. Chewing releases the penicillin slowly and maintains therapeutic salivary levels for 2 to 4 hours. Chewing also stimulates local circulation, useful in trismus associated with pericoronitis, or acute gingivostamatitis. Dosage: 3 or 4 troches daily, or every hour or two if indicated. Boxes of 6 sanitaped troches.

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 172 *and* 173)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor
DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

$10 will be paid to author on publication of accepted suggestions.

thesis usually provides for vitamin K.

Gyorgy, Paul: Fat-Soluble Vitamins —Fallacies of Ill-Advised Therapy, Am. Practitioner 2:79-81 (*October*) 1947.

Diabetes in Children

It has been estimated that there are some 56,000 diabetic children in the United States. This means that one child in 6,000 becomes diabetic. The problem of diabetes in children is one of gravity as the number of diabetic children equals the total number of children affected with complete deafness, heart disease, and blindness.

The mortality is decreasing yearly because of the greater knowledge possessed by the profession and the public about diabetes. Treatment today rests largely on the education of the laity as to how to deal intelligently with the problem.

Two factors stand out as prominent causes in the etiology of diabetes in children. They are heredity and infection.

On the whole, heredity has been demonstrated in about 50 per cent of children who have had diabetes ten or more years. The incidence in Jewish children is nearly double that in gentile children.

Infection plays a considerable role in the etiology. Diabetes frequently appears after an infection such as mumps, measles, or influenza. It is recognized that when a diabetic child develops an infection, his diabetic state is aggravated. Often it is necessary to double or even treble the insulin dose during the period to hold diabetes in check.

Today the diabetic child is not only being kept alive but is growing normally with an ample amount of energy to compete with his nondiabetic playmates. The diabetic child must not only get an adequate allowance of food but also sufficient insulin to utilize the food ingested.

Treatment of diabetes in children is complicated by many factors such as coma, infections, dietary indiscretions, and obesity. Therefore, treat-

ment in each case must be highly individualized.

Records show that diabetes in the older persons tends, with care, to require less and less insulin; however, in children it requires more and more insulin. Obesity plays an important role in adults but in children it plays only a minor role.

Treatment is a lifelong problem and must be thought of in terms of decades. The point to be stressed is to give the child ample food and an adequate supply of insulin. Complications such as infections, tonsillitis, bad colds, influenza, and mumps require careful guidance by the physician to save pancreatic function. Infection results in an increase in blood sugar and urine sugar. It is wise to hospitalize these patients during such periods so that proper measures can be instituted.

If a child is sick and is not eating or is vomiting, he requires insulin just as he does during normal periods. This is important to prevent coma. One of the discouraging things in the management of diabetic children is the progressiveness of arteriosclerosis which seems to appear at an early age. Little is known about it and it is hoped that time will offer a brighter outlook.

Children from five to eight years require from 1600 to 1800 calories; children from nine to twelve years need from 1800 to 2000 calories, and children from twelve to sixteen years need from 2000 to 2400 calories daily. Every child should get a quart of milk daily because of the vitamin and calcium content which all children need. It is permissible to allow a greater amount of carbohydrate than formerly. This makes the diet more palatable and more easily arranged; also, children do better on it. As much as 160 grams is allowed in a 1600 calorie diet and 200 grams of carbohydrates in the 1900 calorie diet. In order to be certain of adequate utilization of the diet, the urine should show little or no loss of sugar.

John, H. J.: Diabetes, St. Louis, C. V. Mosby Company, 1946, pages 163-184.

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Tycoon With A Toothpick...

You could tell he was a big time operator by his $10 necktie and the diamond ring that he flashed around the room like a radio beacon. He knew what wine went with what dish and could even make out some of the French words on the menu. He knew just what waiter to call "George" and what one to whisper to and gesture with in a continental manner. In fact, he was such a sophisticate that he ordered the steak broiled at a precise degree and for an exact time and the salad dressing prepared according to his own private recipe. Of course, he paid extra—plenty extra—for showing off these accomplishments.

Throughout the ritual of ordering and during the elaborate meal, I was speechless with awe to see such a tycoon in operation. For my part, I only know a couple of different drinks to order and even with this sparse knowledge, I usually play it safe and end up with a drink of whiskey and plain water. As for making sense out of French words on the menu card, I have no talent whatever. It never occurs to me to ask for some exotic dish that isn't listed on the menu. And as for telling a chef how to set his thermostat and for how long or asking for a special concoction of salad dressing—I wouldn't dare that.

After the meal with the Corona Corona and the liqueur, the tycoon pulled a ragged toothpick from a pocket in his $200 suit. With deft and expert touch, he curetted the interspaces between his old amalgams. He had a little more trouble with the debridement around his antique vulcanite partial denture.

Here is a fellow who can buy the best, who lives in an exclusive residential section with butlers and maids tripping over each other. He has two or three cars, maybe a yacht. His clubs are the best and the most expensive. His vacations cost thousands of dollars a year. Why does he need a toothpick? Because no dentist at any time convinced him that there are qualities in dental service as there are in other services and tangible things; because no dentist told him that dental appliances wear out and should be replaced; because no dentist expended the time or energy to tell him that progress is being consistently made in the design and fabrication of dental appliances.

When this tycoon went to a dentist, he probably had his teeth "cleaned"—a sort of dishwashing or automobile scrub job. Maybe he had x-rays made, occasionally. Nobody bothered to tell him that his gingivitis might be a disease and that the lame and sore tooth that he developed once in

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a while might also be the result of disease. You can be sure that no dentist even intimated that facial collapse and some facial and head pains might have originated in the dental tissues.

I don't blame the tycoon with the toothpick. No dentist told him the facts of dental health. This man is smart in business, alert and acceptable in social affairs, generous and farsighted in his community responsibilities. He is, however, an ignoramus on health subjects. Every time we see a tycoon with a toothpick, an attractive woman with a collapsed face, people with untreated soft tissue disease, we are looking upon *our failures in dental health education.*

Blood for All . . .

Many people think of the National Red Cross as an agency mobilized exclusively for war or disaster relief. This is not the case. The National

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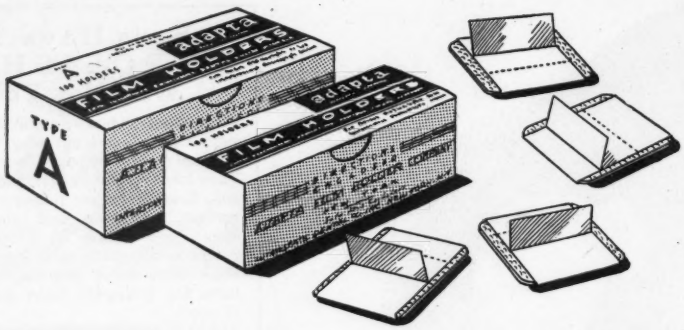

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Panel Switch for instant change from "continuous" to "timed" operation.

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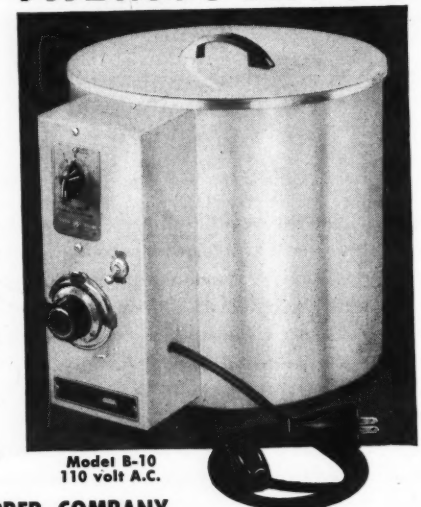

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THE HYGIENIC DENTAL RUBBER COMPANY
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Blood program is an example of the American Red Cross organized to serve all the people, all the time. One of the medical writers for the new National Blood Program writes for us as follows:

"With four units of a national network of blood centers put into operation since the beginning of the year, the American Red Cross has taken the first steps toward ensuring that the nation's physicians and hospitals shall receive the vast quantities of blood required for present-day medical practice.

"The new National Blood Program of the Red Cross is an outgrowth of its wartime experience in collecting blood for the armed forces and has been launched in response to the urgent and growing need for a stable and adequate supply of blood readily available for treatment of the ill and injured.

"The first four blood centers have been opened in Rochester, New York; Wichita, Kansas; Stockton, California; and Atlanta, Georgia. It is anticipated that by the end of 1948 fifty such centers will be in operation. These centers will be followed by the establishment of others at focal points throughout the nation. The long term plans of Red Cross anticipate the establishment of 140 regional centers in metropolitan areas, 250 secondary centers in smaller cities and towns, and several hundred mobile units to serve rural and suburban communities.

"Both fixed centers and mobile units will be staffed by highly skilled and specially trained professional personnel. This new program is a long range one and it is believed from three to five years will be required for it to cover the entire country.

"Medical authorities estimate that approximately 3,700,000 annual blood donations will be needed to meet present-day medical requirements. As medical knowledge in blood therapy grows, greater quantities of blood may be required to meet national needs.

"Under the new program, blood will be taken from voluntary donors

TYPICAL COMMENTS WHICH MADE A NINTH REPRINTING NECESSARY . . . .

Visual Education in Dentistry is more widely used in patient-education programs in dental offices than any other material of a similar nature. Surely there is a reason why the sale now totals over 85,000 copies!

Once *you* use this series of charts in your practice you'll use it constantly. Tangible evidence that thousands of your colleagues are using them is the fact that the current edition is the *ninth reprinting.*

Despite much higher production and paper costs the price of the latest reprinting is still only $1.00 to regular subscribers to Dental Digest. To non-subscribers the price is still $2.00 unless purchased in combination with a subscription (see coupon). The low price is possible only because of the tremendous demand for the charts which show pictorially the *value of periodic dental care and the danger of neglect.*

Many practitioners are ordering two copies . . . for reception room and operatory use. Here is an ethical way of spreading patient-education material of recognized value.

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at the fixed centers and in mobile units; it will be typed, classified, and distributed to civilian, service, and veterans hospitals on the basis of community requirements.

"All costs incident to the collection, processing, and distribution of blood will be borne by Red Cross, and the blood will be furnished to physicians and hospitals without charge. The only cost to patients receiving the blood will be the fee charged by physicians or hospitals in connection with its administration.

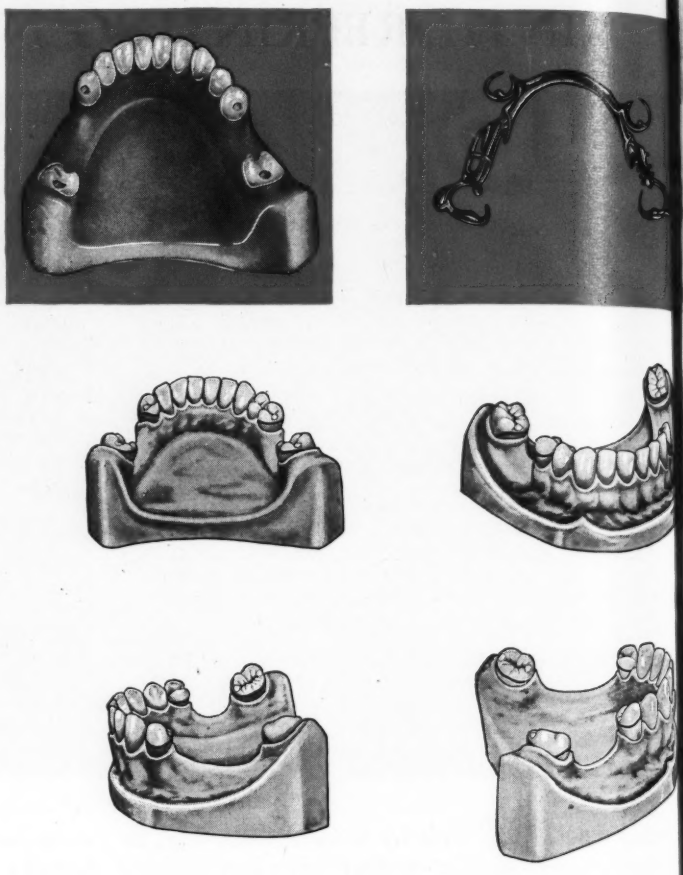
"This new and most extensive peacetime health program in the history of Red Cross was launched after consultation with leading medical authorities in the field of blood therapy, the American Medical Association, the American Hospital Association, the Army, the Navy, the Veterans Administration, and the U. S. Public Health Service.

"Centers will be established only after consultation with medical and hospital associations in the community proposed to be served. The organization will work in close cooperation with the medical profession and a medical advisory committee, appointed at the local level, will assist the centers in meeting community needs.

"All blood centers will be equipped with modern laboratory facilities. Blood taken from donors will be plainly marked as to type, will bear a tag showing the date of withdrawal from the donor, and will be packed in refrigerated cases and delivered to hospitals in response to periodic requisitions. Such blood as remains on hand in hospitals when the expiration date of usefulness for transfusion has been reached will be returned to centers and reduced to plasma.

"When the program reaches the stage of development where sufficient blood is available, a part of it will be processed into derivatives of proven clinical value and these, also, will be furnished to physicians without cost. Distribution of whole blood will be direct from Red Cross centers, but when derivatives become available they will be distributed through state and local health departments."

"RINGS AND BACK-ACTIONS



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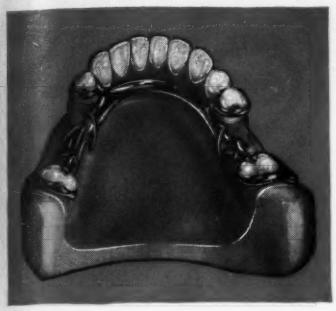
$25 a Week Is Enough . . .

I figure that the average radio comedian works thirty minutes a week plus an hour or two practicing the gags that other people have written for him. It seems to me that paying him $10 an hour would be sufficient for the skill and training involved. That would give the professional funster about $25 a week and the privilege of working like other people the remainder of the time at something more productive.

In the days of the vaudeville show, the comedian was accepted as a funny man or at least one that tried hard to make laughs. That was the day before he became an oracle and emitted nonsense on all manner of subjects, including international affairs, economics, and philosophy. The comedian has come to the present stage of oracular importance because he is paid too much. Pay anybody a thousand dollars or more per week for working two or three hours and he is bound to take himself seriously.

. . . "



This is not an especially difficult or unusual mouth condition to be restored, but many partial dentures made for it are partial or complete failures. A very common design uses #1 (bucco-lingual grip) clasps on the four abutment teeth. Ney Surveyor analysis will show natural undercuts distally of the bicuspids and mesially of the molars. The rigid truss arm and heavy bracing shoulder of a #1 clasp cannot enter these undercuts and when the design of the case is modified so that it can be seated, all or most of the retention is lost.

If, on the other hand, the rules of the Ney Surveyor system are followed, this type of mouth generally produces back-action clasp indications on the anterior abutments and ring clasp lines on the molars. Since it is normal for lower molars to lean mesially and lingually, the greatest amount of undercut appears at the mesiolingual corner of the tooth. A properly designed ring clasp starts high at the mesial occlusal rest, stays above the survey line on the buccal where there is no retention and begins to enter the undercut after it passes the distal occlusal rest. The flexible tip and most retentive portion of the clasp is placed in the mesial and lingual undercuts . . . the logical place to seek retention.

Similarly, the back-action clasps on the bicuspids are designed to take advantage of — rather than conflict with — the natural undercut and retention conditions adjacent to these teeth. That is the fundamental approach used by the Ney Surveyor system in tackling any of these problems and is a major reason for its consistent success.

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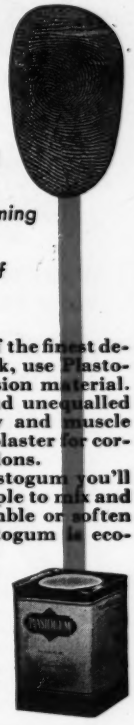

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In a society where the worth of people is judged by how much they are "worth," large salaries carry a prestige value out of all proportion to the work performed. The movie and radio people who are paid $100,000 per year and often three times that amount contribute little when compared to the research scientists, the teachers, the clergymen—yes, even the dentist.—E.J.R.

Operation Crossroads—Bikini Lagoon

HAROLD C. HODGE, Ph.D.,
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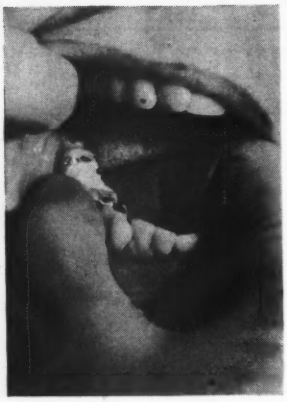

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be contrasted with the amounts of radium remaining in the bodies of some of the women employed during World War I as radium dial painters.

One Microgram of Radium—These women, despite all safeguards, persisted in tipping on their tongues the brushes they were using to apply radium paint to airplane dials. Those unfortunate enough to retain lethal amounts of radioactive material died of cancer from radium deposited in the bones; deaths were recorded five, ten, and even fifteen years later. One of the women who died nearly fifteen years after exposure had in her body at that time only one-millionth of a gram of radium (1 microgram).

Tons of Radium—Contrast these two quantities: the equivalent of several thousand tons of radium in the water versus one-millionth of a gram of radium retained in the body and producing death by cancer in fifteen years. No wonder the medical men in charge of the Bikini tests have repeatedly given us warning!

Atom Bombs versus Civilization

A committee headed by Doctor Albert Einstein has given us six statements of fact: (1) Atom bombs can now be made cheaply and in large numbers. They will become more destructive. (2) There is no known defense against atom bombs, and none is to be expected. (3) Other nations can rediscover our secret processes by themselves. (4) An atomic armament race is futile; and, if attempted, will ruin the structure of our social order. (5) If war breaks out, atom bombs will be used, and they will surely destroy our civilization. (6) There is no solution to this problem except the international control of atomic energy and, ultimately, the elimination of war.

—From *Journal of Dental Research* 26:439 (December) 1947.

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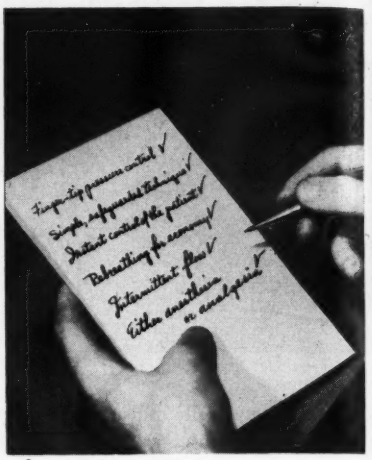

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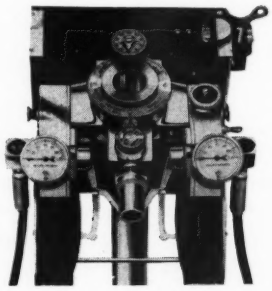

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